The Orchadian

Volume 15, Number 3 www.anos.org.au March 2006

Official Journal of the Australasian Native Orchid Society

Royal Botanic Gardens
Melbourne

31 MAR 2006

LIBRARY

Thelymitra stellata in the Perth Hills
Photo Mike Duncan

The Orchadian

Official Journal of The Australasian Native Orchid Society Inc.
Founded August 1963
www.anos.org.au
Dedicated to the Study and Conservation of Australasian Native Orchids
Print Post Approved PP239628/00002, ISBN 0474-3342
Patron; Walter T. Upton
March 2006 Volume 15 Number 3

CONTENTS

Features

Culture of fungus dependent terrestrial orchids .... Les Nesbitt 102
How to grow *Dendrobium speciosum* the Ted Walmsley way .... Ted Walmsley 108
Late spring orchids in Western Australia .... Mike Duncan 111
Morphometric Analysis of "*Dendrobium* Big Foot"
reveals these plants are hybrids ....Dr. Peter Adams 114
Recent studies of the biology of the Yellow Hyacinth Orchid –
Dipodium hamiltonianum .... John D. W. Dearnaley 129
Rhizanthella omissa, a new species of Underground Orchid
from south eastern Queensland .... David L. Jones and Mark A. Clements 131
A.N.O.S. Conservation Report .... Alan Stephenson 134
Native Orchid Show at Geelong .... Frances Wilde 137
Ira Butler Trophy presentations for 2005 .... Bill Olsen, I.B.T.C. Sec. 138

Photographs

Caladenia tentaculata (specimen pot, project pots and seedlings) 100, 101, 104
Caladenia brownii near Manjimup 113
Diuris emarginate near Rocky Gully 113
The ornate column structure of *Thelymitra dedmaniarum* in the Perth Hills 113
The delightful *Thelymitra cucullate* near Walpole 113
D. Big Foot and *D.* Big Foot No. 1 (NRF) 116
D. Big Foot J.McM. No. 2 and *D.* Big Foot" Sapphire 117
D. kingianum 'Big Foot Father' , *D. kingianum* 'Norma's Pink' and
D. Big Foot" 'J. McM. No. 2' 120
D. Gillian Leaney 'Breeder' and *D.* Big Foot" 'Sapphire' showing very wide,
stout bases of pseudobulbs 121
D. kingianum 'The Monster' X "*D.* Big Foot", *Dendrobium* Big Foot" 'J. McM. No.1,
D. Big Foot" 'No. 1 (NRF)' X *D. kingianum* 'Niagara', and *D. kingianum* 'The Monster
X "*D.* Big Foot" 'J. McM. No.1 124
"*D.* Big Foot" X *D. kingianum* 'Niagara' , *D. kingianum* 'Tunstead's Pink' X
D. kingianum 'Niagara' and "*D.* Big Foot" X *D. kingianum* 'Niagara' 125
Dipodium hamiltonianum, (flowers, root system) and Brown fungal pelotons (coils) . 128
Rhizanthella omissa and *Rhizanthella slateri* (drawings) 133
Sarcochilus Star Struck 'Red Comet' x self and Luba Mishura with her basket of
very well grown and flowered *Sarcochilus* 137
Dendrobium speciosum var. speciosum 'Heather' and *Dendrobium* Anne's Rainbow
Surprise 'Diana' 140
Dendrobium (*D.* Angela x *D. tangerinum*) x *D. canaliculatum* and
Dendrobium polysema 141
Mike Duncan and a >2 m tall *Prasophyllum regium* plant at Bridgetown .... Back Cover

COUNCIL OF ANOS Inc.
President: Graham Slater
Vice-President: Bill Olsen
Secretary: Irene Bodell
Treasurer: Robert Murch
Past President: Roslyn Capell

ANOS Councillors:
Bill Dobson
Lorraine Dobson
Graeme Bradburn
Peter Presland
Elvi Hochguertel
Matt Hochguertel
Les Winch
John Creeggan -
(National Registrar of Judges)

Royal Botanic Gardens
Melbourne
31 MAR 2006
LIBRARY

Editor, *The Orchadian*:
Peter Eygelshoven
13 Weeroona Ave,
Elanora Heights, NSW 2101.
peygelshoven@optusnet.com.au

Membership Officer:
Bill Dobson; 34 Lynwood Ave, Cromer 2099
bdobson@optusnet.com.au
All membership enquires should be directed to Bill Dobson.

Conservation Officer:
Alan Stephenson:
astephenson@vtown.com.au

ANOS CORRESPONDENCE:
A.N.O.S. Inc. P.O. Box 318,
Willoughby, N.S.W. 2068

ARTICLES:
Items for consideration may be submitted to the Editor on disk or via e-mail using Microsoft Word, Works or Wordperfect.
Good quality sharp colour slides, prints or illustrations may be submitted with articles. 300dpi digital photos can also be submitted. All efforts will be made to return images after publication.

COPYRIGHT:
Material in *The Orchadian* is subject to copyright and may not be reproduced without permission from the author.

SUBSCRIPTION RATES (AUD$)
$40 Australia
$50 Asia/Pacific
$60 Other Countries

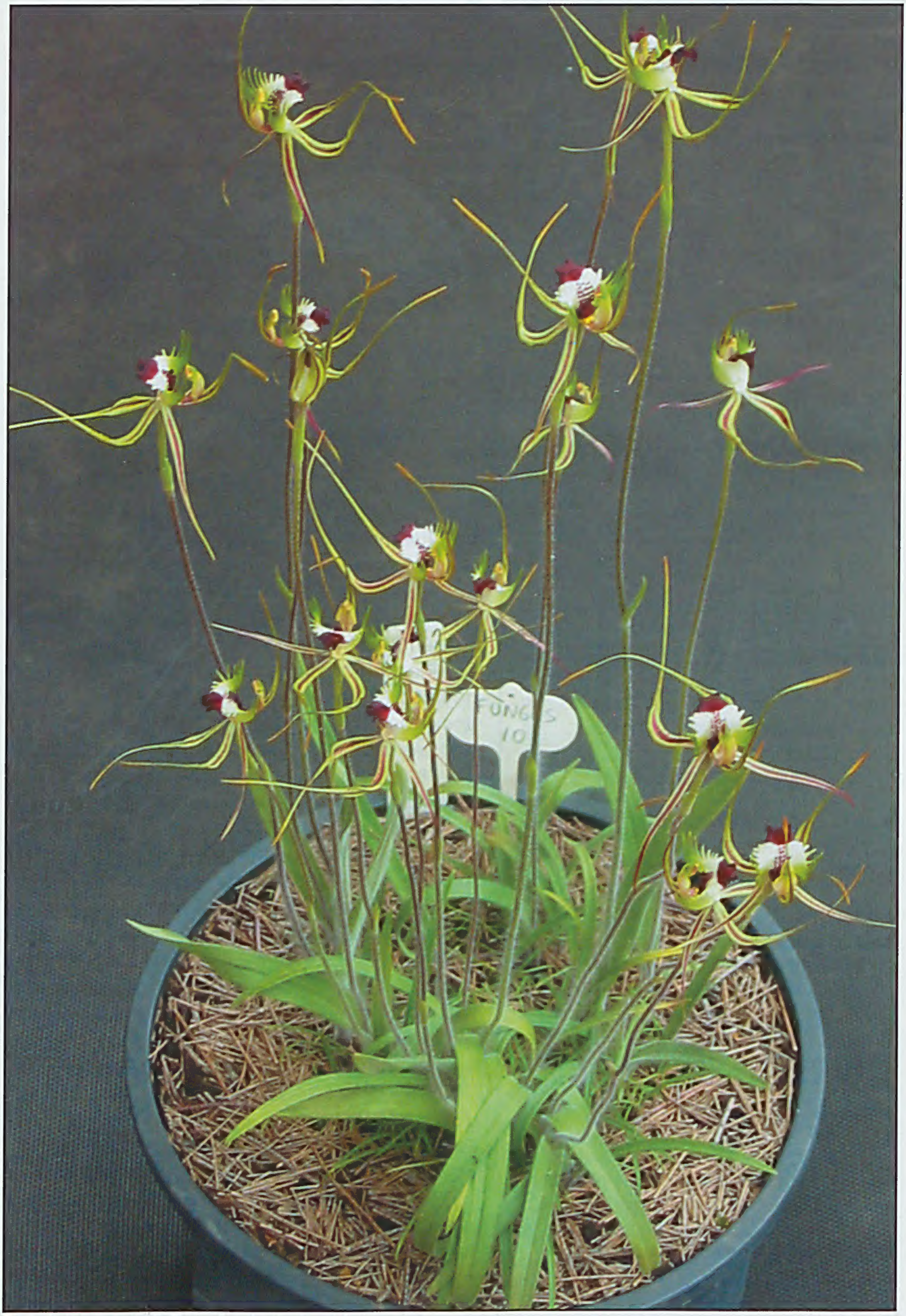
Editorial

Well this issue certainly should have something for everyone. We start with a great conservation article from Les Nesbitt of South Australia, Nesbitts Orchids. Les tells us how he has raised thousands of Spider Orchids for a project sponsored by the Australian Orchid Foundation. In the next paper Ted Walmsley, of the Speciosum Spectacular at Kempsey, has passed on some of his cultural tips to help us grow better 'speciosums'. Mike Duncan of Victoria then takes us over to Western Australia for a look at some late flowering terrestrial orchids. I think we need to have a competition to see if anyone can find and photograph a terrestrial taller than two metres. Dr. Peter Adams has done some scientific work on a suspect little orchid known as *Dendrobium* 'Big Foot', an orchid almost as infamous as its name sake. John Dearnaley of Queensland has been studying *Dipodium hamiltonianum* and found there is a little more to this terrestrial orchid than we thought. David Jones and Mark Clements name a new orchid, *Rhizanthella omissa* of Queensland. Alan Stephenson briefs us on the Conservation work he has been pursuing. Frances Wilde gives us a show report of the Geelong Group Show in 2005 and we finish with the Ira Butler Trophy results. This has been an issue I have enjoyed reading and putting together immensely, so I hope you do enjoy reading this issue too.

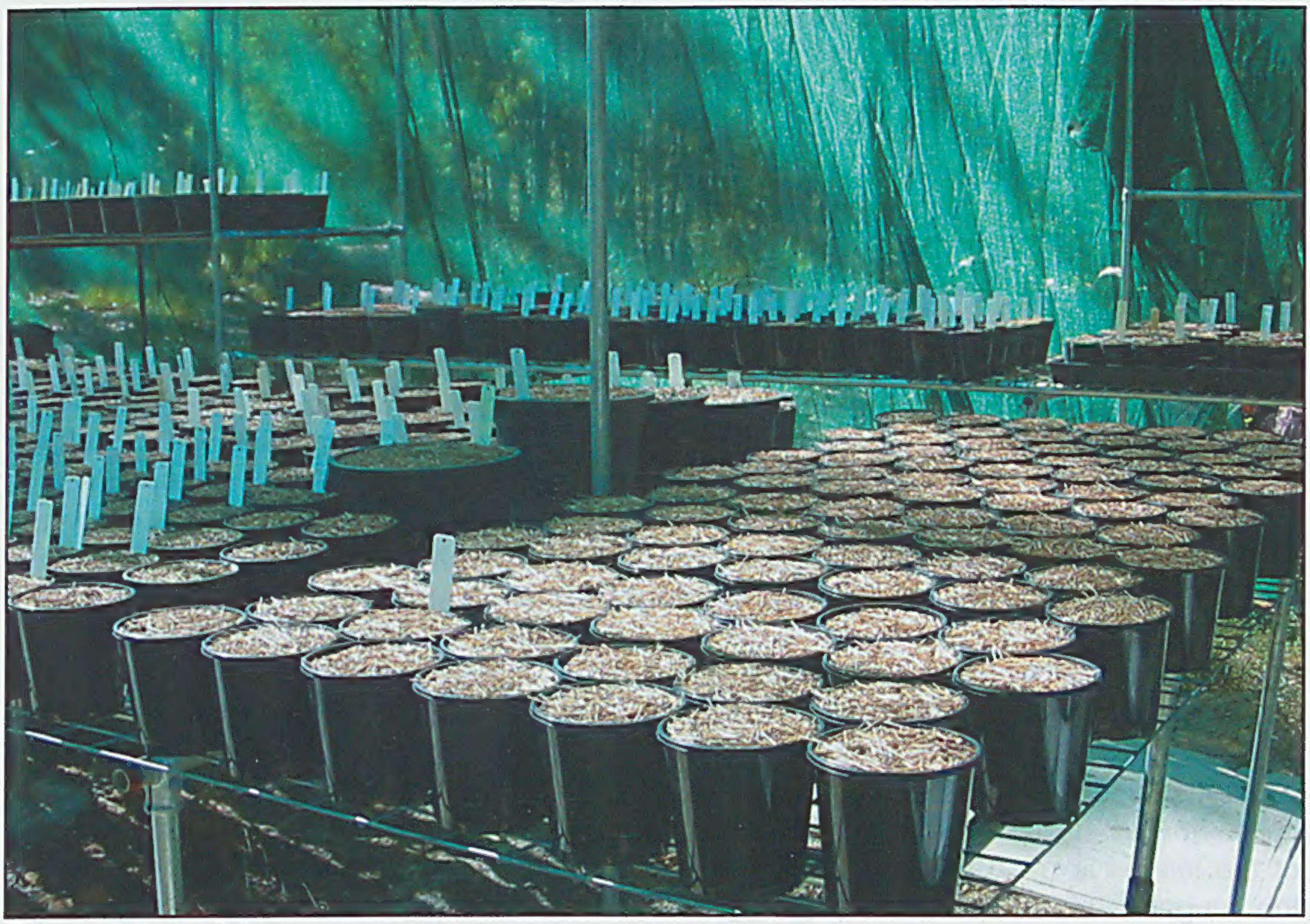
You will have noticed there is a renewal form with this issue, it's that time of year again! It would help us at ANOS greatly if members process their renewals quickly (at least the Treasurer will earn his keep). Reminders will be sent out with the June issue and a reminder letter in August, if renewals have not been received by these times. As always we are looking for new subscribers so talk to friends and tell them about The Australasian Native Orchid Society Inc. and *The Orchadian*.

Also, have look at our website. Graeme Bradburn is updating the pages and information on it, so all ANOS Groups and Associated Groups should check on their Group's details and let Graeme know if there are any changes. Finally, I do need more material for all the future issues so start writing please.

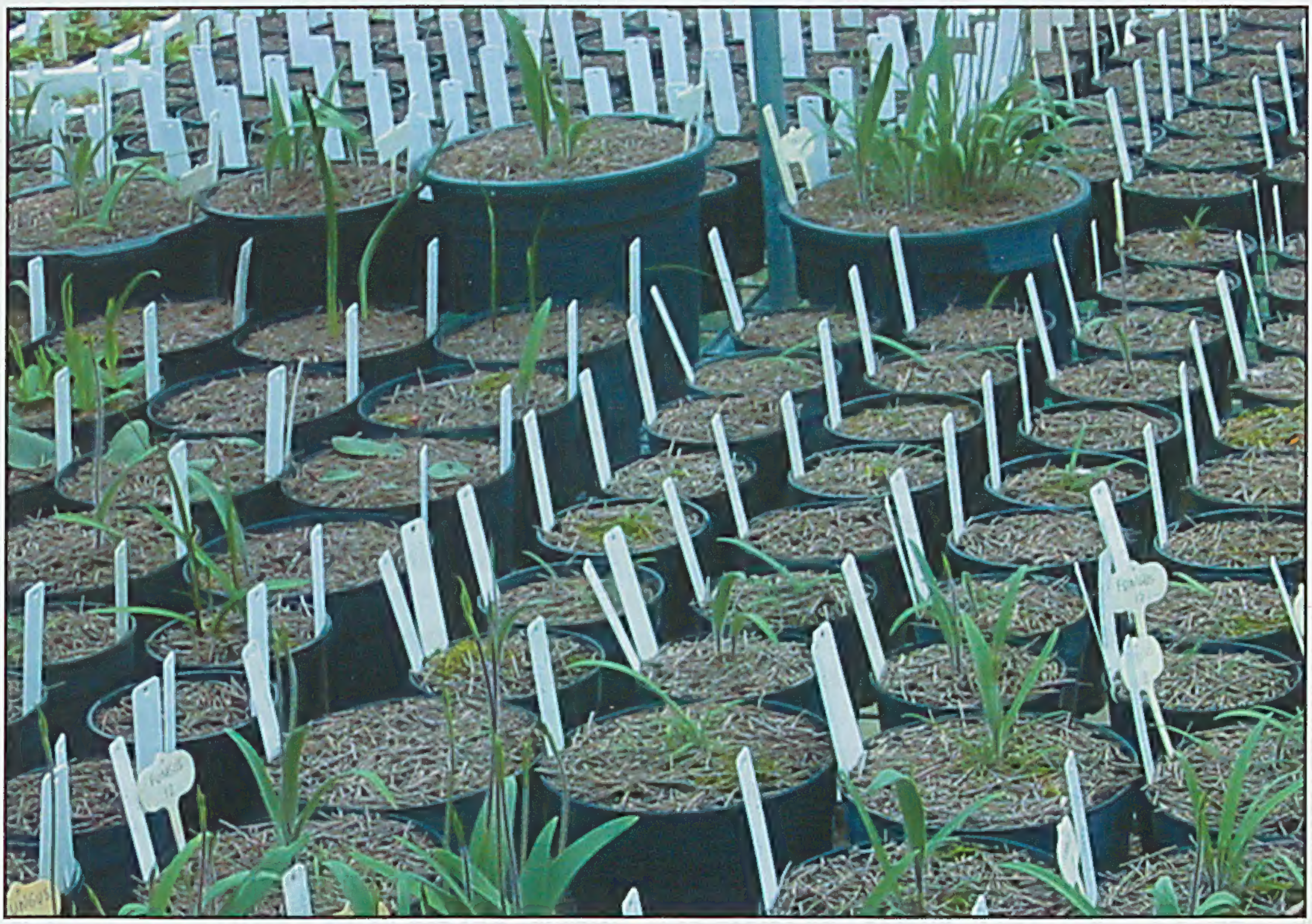
Happy flowering, Peter.



Specimen pot of *Caladenia tentaculata*.



Terrestrial shadehouse.



Project pots with one - three year old seedlings.

Photos Les Nesbitt

Culture of fungus dependent terrestrial orchids.

Les Nesbitt
PO Box 72
Walkerville SA 5081

Introduction

Many of Australia's terrestrial orchids are fungus dependent and have been difficult to cultivate in pots in the past. Nowadays an increasing number of growers are learning the techniques for success, especially in Victoria where an active ANOS group meets regularly. Time is running out for the rare species so it is important that living collections of these fascinating plants can be maintained in cultivation as well as in the bush. I selected *Caladenia tentaculata,* a fungus dependent orchid, for my propagation project sponsored by the Australian Orchid Foundation as I had plants, seed and fungus available. This article describes the methods that I have used to raise three thousand seedlings of this species in the past three years around larger plants called 'mother plants'.

Fungus dependent orchids will fade away within two years if the fungus dies out. Management of the fungus is as important as managing the plants. The fungus cannot be seen with the naked eye so the health of the leaves is used as an indicator that the fungal relationship with the orchid is working. The appearance of new seedling leaves around mother plants each spring confirms that the fungal relationship is healthy. *Caladenia tentaculata*, a Green Comb Spider Orchid, is a key species for practicing the techniques to be applied to other less common fungus dependent orchids, as it is relatively hardy and grows in a variety of soil types and environments.

Rules

Terrestrial growers have to apply a few different rules when growing fungus dependent terrestrial species:

a) Never use fertilisers as they kill fungi. Make life easier by grouping fungus dependent orchids together and separated from other orchids that are fertilised.
b) Feed the fungus by adding new leaf litter on top of the old litter layer each summer. Fungi can break down cellulose.
c) Do not repot unless absolutely necessary. Some examples of when to repot would be when the tubers reach the bottom of the pot or come out the drainage holes; overcrowding; disease.)
d) When repotting, always keep the surface layer on the surface. If the leaf litter gets buried under soil the fungus can be lost. The fungi are most active in the top few millimetres of the mix.
e) Every year hand pollinate some flowers, collect the seed and sow the seed around mother plants. Seedlings are needed to replace plants lost to predators, disease and bad culture since most fungus dependent terrestrials do not multiply.
f) During dry weather periods watering with rain water is better than using tap water.

Getting started

Beginning to grow these orchids is not easy as fungus dependent orchids in pots are not available from nurseries just yet. Flasks of seedlings are available but not yet with seedlings and fungus together.

A few relevant ideas for getting that first mother pot are listed below:

a) Pot up plants and soil on an

approved rescue dig. Rare events these days but sometimes organised for members of orchid societies or conservation groups on land that is about to be cleared for 'development' or forest plantations.

b) Swap something with another grower for a mother pot of *Caladenia*.

c) Plant out seedlings from asymbiotic flasks to pots of soil mix in autumn or early spring. This has a very low success rate but often is the only way to get new fungus dependent species. Slightly better success if the seedlings can be inoculated with the appropriate fungus by planting out into mother pots containing similar species.

d) Collect a little surface leaf litter from near *Caladenia* plants to inoculate the deflasked seedlings with the fungus or to start new mother pots to be seeded. It only needs a tiny section 5 mm square from another grower's mother pot.

Shadehouse

An ideal terrestrial house should be sealed to keep out birds and animals and have shadecloth or wire mesh sides to allow the breeze to move through. I prefer a roof of angled 50% shadecloth but growers in wetter or frost prone areas use a solid roof of plastic or fibreglass. A solid roof means that the pots have to be watered by hand which is more work. Bear in mind that I live in Adelaide, which has a Mediterranean climate with cool wet winters and hot dry summers. Adelaide's average annual rainfall is about 500 mm falling mostly in winter and spring. My other growing area in the Adelaide Hills at 500 m elevation receives about 900 mm annually. Frosts are rare events nowadays. Adjustments may be necessary in other parts of Australia.

It is very important that winter sun reaches the plants for at least four hours a day so site the shadehouse away from the winter shadows of buildings and evergreen trees. Galvanised mesh benching about 750 mm high will deter slugs and snails and is a convenient height for observing the pots.

Pots and mixes

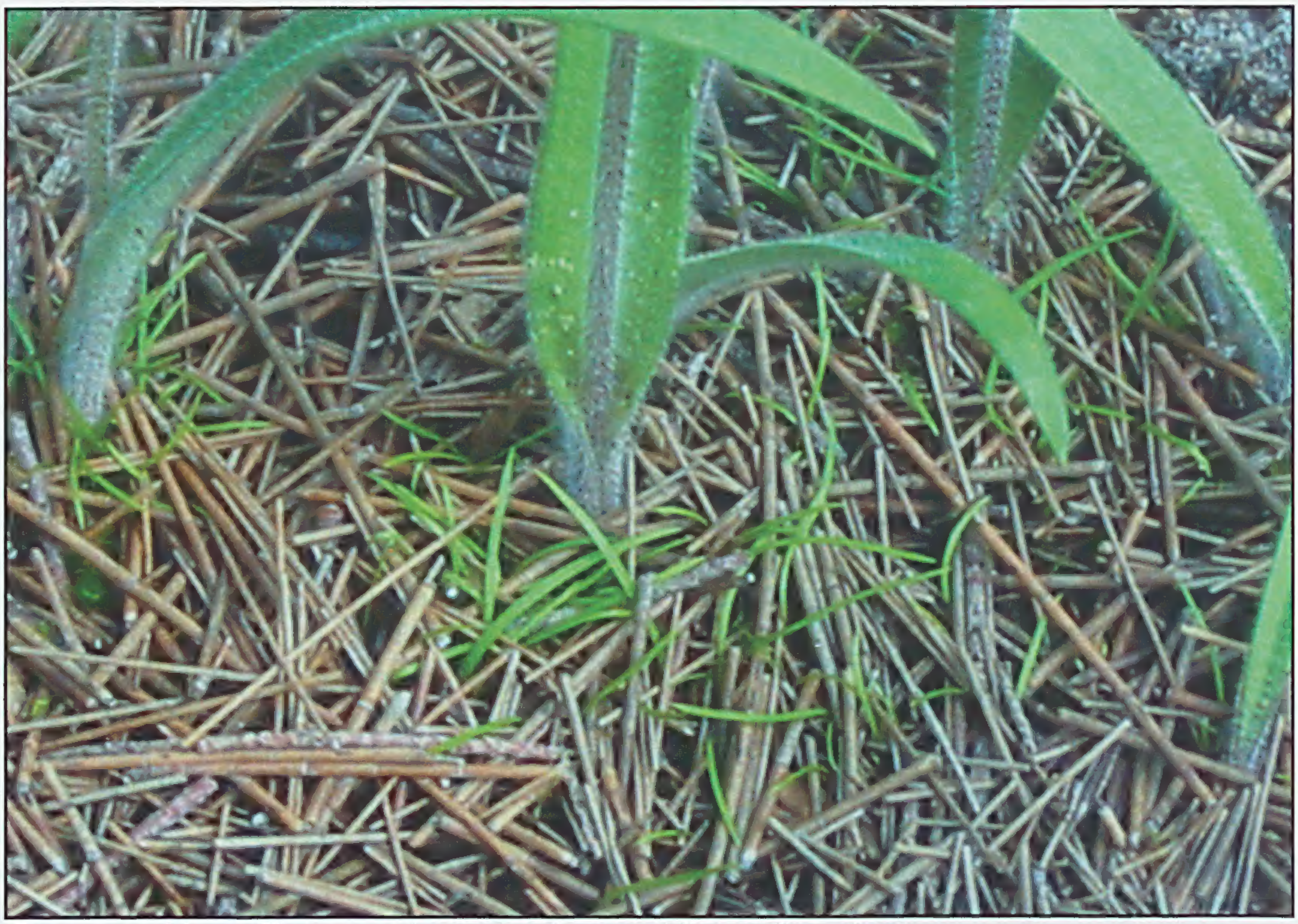
Pots can be clay or plastic. I use plastic pots as they are easier to clean and sterilise. Size of pot and openness of the mix are linked as larger pots with the same mix stay wetter for longer. Recommended sizes are 150 mm to 200 mm standard pots. Larger exhibition pots will need more sand in the mix to improve the drainage. For caladenias I use a free draining hills soil mix containing grey topsoil, yellow clay subsoil, and a small proportion of half rotted gum tree leaf litter with 50% coarse gritty sand to ensure perfect drainage.

Topping

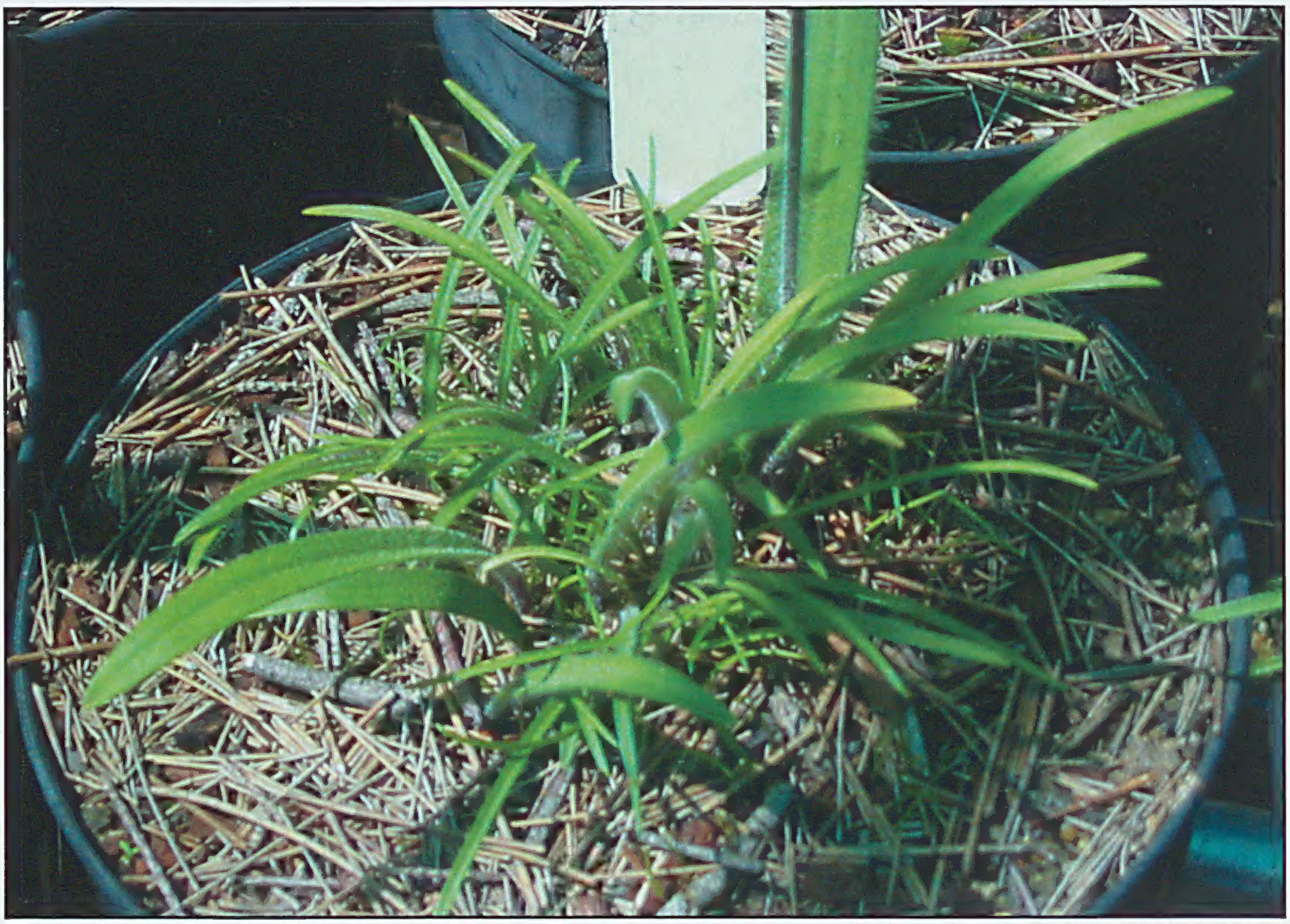
A topping layer 3 mm thick covering the surface of the pot is very important to maintain healthy fungus and to minimise erosion from water dripping off the shadecloth roof. It also acts as a mulch to moderate soil temperatures and retain moisture. I prefer chopped up sheoak needles but *Pinus radiata* needles are a poorer substitute. Alternatives are gum nuts or leaf litter from under hard leaved native plants. The litter should last more than one year and must never go mushy. The leaf litter layer is replenished each summer. It is a food source for the fungi. Fungi and mosses will bind the litter together by mid winter. New pots may need some replenishment until then.

Some proven toppings to use on their own or in combination are:

- Sheoak needles chopped to 20 mm lengths.
- Rotted gum tree centres put through a 5 mm sieve. Mine comes from very old hollow trees



One year old seedlings growing around around the mother plants.



Typical pot of one - three year old seedlings.

of *Eucalyptus obliqua* and *E. baxteri*).
- Small sticks, gum nuts and leaf stalks from stringy bark trees.

Essential maintenance

Pull out any weeds that germinate while they are still small to avoid disturbing the *Caladenia* plants and seedlings. Inspect pots weekly for any sign of rotting of the leaf bases. My worst problem is rot and it can quickly kill all the plants in a pot. Move any rot infected pots to a covered area far away from healthy pots and keep the leaves dry. If all plants die then dump the pot and contents. Once established, the rot will reappear next growing season. Sometimes a few plants can be saved by knocking out the pot, pulling off unaffected plants from the edge, and potting them up again in fresh soil mix.

Caladenia tubers go deeper each year. Eventually the largest or oldest will hit the bottom of the pot and should be repotted at this time or the tubers may rot in winter as the bottom of the pot may stay waterlogged. I knock out the plug of soil when the tubers are dormant. If tubers can be seen at the base, I pull off the bottom 20-30 mm of soil and place it to one side for starting new pots. I put 20-30 mm of new soil in the bottom of a clean pot and replace the plug of soil. The soil is tamped down and watered in. The tubers of any seedlings in the original pot will still be there as they are not so deep and will grow normally next season. The tubers recovered from the bottom of the pot are left with a 20 mm long wick of the old stem attached. They can be planted 30 mm deep in a new mother pot. Remember to transfer a pinch of topsoil and leaf litter from the original pot to the top of the new pot hopefully with the fungus.

If a dropper grows out of a drainage hole, any new tuber will shrivel up in the hot dry summer air and be lost. A dropper is a special root on which the new tuber forms. It can be short or long and usually grows vertically downwards. When a dropper is seen, I place the pot into another pot half full of sand and repot when dormant. Seedlings that appear late in the season (November) should be sacrificed for the good of the mother plants that are about to go dormant. Do not keep hand watering. Large tubers may rot if kept wet in hot weather. I also remove all old leaves and flower stems after they have dried up during the dormant season to help control disease.

Slugs, snails and grubs love to eat *Caladenia* leaves so watch for them. I prefer to pick them off at night rather than use sprays.

Seed production

Most fungus dependent species do not multiply. They do not respond to the pulling off the tuber method either. They have to be propagated from seed. Hand pollination of flowers each year is essential to obtain seed as there are no *Caladenia* pollinators in my shadehouse. Now that I have many *Caladenia tentaculata* flowering plants I can choose those with a large leaf to carry a seed capsule. Producing a flower does not seem to weaken plants whereas carrying a seed capsule to maturity is a big drain on the tuber.

I use a sheoak needle, but a toothpick will do, to lift out the pollen from one flower by stroking upwards to lift the anther cap covering the yellow pollen on the top of the column. The sticky pollen will adhere to the stick. The pollen is placed on the sticky saucer shaped stigmatic depression of another flower of the same species. The stigma is located just behind/below the pollen near the top of the column of a *Caladenia* flower. More seed is obtained if pollen is transferred from one plant to another. If there is only one flower then it can be self-pollinated although this does not enhance biodiversity but may be necessary to save very rare orchids. The flower will collapse within a few days and a seed capsule will quickly form. These will take about four to six weeks to develop and ripen depending on the weather conditions. The whole seed capsule is collected as it turns brown and before it splits open which usually occurs quickly on a warm day in late spring. The dry seed capsules are stored in a paper envelope indoors over summer to protect and condition the seed.

Sowing the seed

This is an annual activity necessary to maintain and increase numbers of fungus dependent orchids like *Caladenia*. Sowing seed on mother pots is best done in autumn just before the season opening rains. I mix one part of seed with ten parts of fine dry sand so the seed is not sown too thickly or wasted. Using a peppershaker, the mixture is sprinkled on the top of pots containing mother plants in March or April. I always gently water the pots after sowing seed to wash the seed down into the topping layer.

Raising seedlings around mother plants

Most seedlings germinate within 20 mm of a mother plant with only a few further away. This can lead to very crowded clumps of plants after a year or two. They should be split apart during the dormant season to provide better airflow around the leaves and to reduce the risk of leaf-rot. Small seedling leaves appear from late July to October. They are only about 1 mm wide and 10-20 mm long at the end of the season. I stop watering in early November. Late growing seedlings are best sacrificed at normal dormancy to prevent rotting the tubers of mature plants. Seedling tubers are very tiny and difficult to see so I do not attempt to repot them. Pin head size is a fair description. Seedlings may take three to five or more years to reach flowering size. The number of mother pots can be increased when an annual crop of seedlings is produced and increased numbers of seedlings can be raised annually if more mother pots are available. Since the project started in 2003 the number of seedlings has increased threefold each year. Not all new seedlings survive the first summer dormancy. I have achieved about 75% survival. Survival rates have been higher in larger pots with the lowest rates in 125 mm pots. Light watering in summer seems to help prevent the tiny tubers desiccating.

Not all mother pots are successful and some are more successful than others. I have observed that mother pots that are more than two years old and contain adult plants and larger seedlings produce the most new seedlings. Successful pots that are split usually continue to be successful.

Creating extra mother pots

Additional mother pots can be created by:

a) Pulling off mature dormant tubers from the bottom of a mother pot and transferring them to new pots. A little of the surface layer from the original pot is scraped off and spread on the surface of the new pot. You can lose everything if the surface layer is mixed in with all the other soil in the pot.

b) Splitting crowded mother pots during the dormant season. Knock out the plug of just moist soil and break it into two or more slices like cutting a cake. Try to make the break through the centre of a clump of seedlings. Place a slice containing plants and seedlings in the centre of a new pot and fill in around it with fresh soil mix. It is important that the surface layer containing the fungus remains at the surface of the new pot.

c) Pricking out a small clump of one year old seedlings with a pinch of the surrounding soil mix and surface leaf litter in July and transferring the clump to a new pot of mix. At this time the seedling collars will have formed at the soil surface and be fungus infected. It is not necessary to get all the seedling tubers as they will be exhausted by then. The seedlings will make new droppers and tubers over the following three to four months before going dormant. I try not to disturb the collars of mature plants in the mother pot when using the tip of a screwdriver for pricking out seedlings.

Activities through the year

- During summer, very lightly water surface of pots weekly to prevent tuber desiccation especially if small dormant seedlings are in the pot.
- Divide overcrowded pots in December, January or February using the cake slice method. Take care to transfer the surface layer to the surface of the new pot.
- Add fresh leaf litter to surface layer in January, February or March. If surface moss gets too thick after several years, peel it off during the dormant period and discard.
- Start heavier watering of pots weekly from mid March.
- Mix seed with fine dry sand and sprinkle seed on mother pots in April.
- Water as required in autumn, winter and spring so that pots never dry out completely during the growing season yet are not soggy wet.
- Pull out any weeds as they appear in autumn, winter and spring.
- Watch for leaves appearing from Anzac Day to late June.
- Look for new seedling leaves from late July to October.
- Look for flower buds down in the larger leaves from mid July onwards.
- Enjoy and photograph flowers September and November.
- Hand pollinate some flowers in September or October. Flowers collapse within days of fertilisation.
- Collect seed capsules as they turn brown just before they split open in November or December.
- Dry and store seed over summer in paper envelopes kept indoors.
- Allow pots to slowly dry out in mid to late November to induce dormancy and ripen the tubers. Plants should be receiving eight to ten hours of filtered sunlight daily at this time.

Bush environments

The above description is mostly about pot culture but I have also had success using similar methods in the bush on my property in the Adelaide Hill's. I slash the orchid area of about one acre to a height of 100 mm each December after the seedpods have ripened and opened. This lets in the sun and wind which orchids need. It also allows the magpies to walk around and clean up the snails, beetles and grubs. This area has become a herb field full of small ground covers, lilies, native grasses and sundews. To minimise trampling, patches of orchids are roped off with string tied to stakes. The topping layer is replenished naturally by fallen gum leaves and twigs and by the slashings. Seed is collected and sown as with pots. New seedling numbers are dependent on the season as I have not hand watered in the bush. *Caladenia tentaculata* plants have increased in the bush but less rapidly than in pots.

Acknowledgements
I wish to thank the Australian Orchid Foundation for their support in getting this project set up and for forcing me to diligently record all activities and results. I also acknowledge the efforts of my colleagues in Adelaide, Melbourne, Perth and Canberra who have built up a body of knowledge over many years for me to draw on.

-oOo-

How to grow *Dendrobium speciosum* the Ted Walmsley way.

Ted Walmsley
131 Tozer St
Kempsey 2440

Over many years I have been asked how I grow my *Dendrobium speciosum* plants. So I put together this little guide to explain how I grow mine.

Housing

When the plants are first deflasked they are put under 70% shade cloth where they remain until they reach the size of a 200 mm (8") pot. They are then placed with the more mature plants under 50% shade cloth for the rest of their growing and flowering life.

Potting

When plants are first deflasked they are potted into 50 mm (2") tubes using Mini Aus-Gro® (Van Schaik's Quality Products) Orchid Bark (10 mm). The plants are left in these pots until they fill the pot. They should not be allowed to overgrow the pot.

When they fill the 50 mm tube, they are then repotted into a 100 mm (4") pot using Medium Aus-Gro® Orchid Bark (15 mm). They are left in these pots until the pot is full, but again make sure they do not overgrow the pot. If the plant is allowed to outgrow the pot then when it is repotted it does not grow as vigorously as those plants not in an overgrown state. I use standard pots (not squat pots), but crock 25-30% with styrofoam lumps.

When the plant has filled the 100 mm pot it is then potted into a 200 mm (8") pot using Large Aus-Gro® Orchid Bark (20 mm). After potting, half a handful of a 50/50 mix of Blood & Bone and Hoof & Horn is applied around the top of a 200 mm pot (one handful for a 250 mm pot or larger) and watered in lightly. The plants are then left to dry for two to three weeks before normal watering is recommenced. Repotting should then be done every two or at most every three years using the 20 mm bark. Plants only show optimum growth when the bark is changed in this way – plants do not progress in old, stale bark. At the 200 mm pot size, most plants will flower. Under my conditions, providing regular repotting into new bark is done, I find that the period between deflasking and first flowering is generally about six years.

Fertilising

I believe the best procedure is to water one day and to fertilise the next day. I never fertilise into a dry potting mix because, while the plants must never be waterlogged, I feel that if the mix and roots are damp and fresh they will be able to make better use of the fertiliser, as the roots will be more active than if the mix is dry. However, it is always better to be on the dry side with your plants rather than having them too wet.

Every two months during the growing season I apply a solution of Condy's crystals (potassium permanganate) and Epsom Salts (magnesium sulphate heptahydrate). This is made up by dissolving 10 g of Condy's crystals and 100 g of Epsom Salts in 20 L of water. This solution is then applied through a 1/16 fertilizer/water mixer. The solution as applied to the plant therefore contains about 1 g of Condy's crystals and 10 g of Epsom Salts per 32 L of water. Both Condy's crystals and Epsom Salts are available, for example, through Selby Biolab (national customer service no 13 2991, minimum amount 500 g).

In addition to the above, every six months I like to top dress the plants with the 50/50 Blood & Bone and Hoof & Horn mix at the rate of one teaspoon for a 100 mm (4") pot and half a handful for a 200 mm (8") pot.

I also use a soluble fertiliser (Grow Force Flowfeed® GF9) two to three times a year during the growing season at the manufacturer's recommended concentration (in the case of Grow Force® that is about 3 g/L).

I am a firm believer in liming your plants, and have the philosophy that TOO MUCH LIME IS NOT ENOUGH. I use hydrated lime or Brickies' lime (calcium hydroxide). I lime my plants as often as they need it, up to six or eight times a year depending on the weather. I put the lime on as thick as it is needed to give good coverage on the plant.

Pests and diseases

Prevention is the best cure for all ailments or pests which may affect your plants.

For insects, I rotate the use of Rogor® (dimethoate) [e.g. manufactured by Richgrow Garden Products] and Lorsban® (active is chlorpyrofos – an equivalent active is in Richgrow Lawn, Beetle & Grub Killer) at two monthly intervals of spraying so I end up spraying for insects six times a year. Take care to read and act on all manufacturers' safety directions before using these products.

For fungal problems I also spray every two months alternating with the spraying for pests. For this I use Agri-Fos® (manufactured by Agrichem Manufacturing Industries based on a phosphorous acid containing active). Another product based on the same active is Yates Anti Rot Phosacid Systemic Fungicide (the phosphorous acid is present in the form of the mono and di potassium salts). As an alternative, I also use Mancozeb®. Products containing this active (which is sometimes in combination with sulphur) are supplied, for example, by Yates (Mancozeb Plus) and by Garden King Products (Mancozeb).

With all my pesticide and fungicide solutions I add a low level of a wetting agent. For this I use Morning Fresh® dishwashing liquid (Cussons Australia Pty Ltd).

Finally, to prevent viral infections, I sterilise my cutting implements in straight Alginox® (an algicide made by Waterco Ltd, but distributed through for example Big W and Mitre 10 stores and independent swimming pool product suppliers). Remember that you must allow the implements to soak for twenty minutes before use. Note also that the bush house must be kept spotless with no dead rubbish left about such as old leaves and dead plants or sick plants that won't grow. A gravel floor which is raked and limed regularly to keep it fresh is a must in my opinion. If you are a dirty, untidy housekeeper then sterilising your cutting implements is like shutting the gate when the horse has bolted.

These are the essential points of my *Dendrobium speciosum* culture.

I hope you have the best of luck and happy growing.

Note

These cultural notes refer to my conditions and I do not recommend that you selectively use aspects of the above without thinking through the consequences. For example, some fertiliser solutions form insoluble precipitates with lime, in which case the regular application of limewater between fertilising may be more appropriate for you. Similarly, the use of squat pots in cooler areas such as Melbourne may be more appropriate (in which case crocking with styrofoam isn't necessary). Be prepared to experiment to get things right for your conditions and draw on all sources of knowledge.

-oOo-

A New Australasian Native Orchid Society Group for Melbourne.

ANOS Melbourne Suburbs Group was formed in June 2005. The President of ANOS Council, Graham Slater, and Secretary Irene Bodell, visited on 23rd October and welcomed the new society. The President is Peter Adams, and Treasurer David Brewster. Enquiries should be directed to the Secretary, Margaret Elgood, on Ph. 59622758. Correspondence to ANOS Melbourne Suburbs, PO Box 239 Mt Evelyn Vic. 3796.

The group follows the guidelines and objectives of the Australasian Native Orchid Society Inc., and plants are judged at meetings and shows according to the ANOS Judging Handbook. The Group meets usually on the fourth Wednesday of the month at 7.30pm at Montrose Primary School, Leith Rd., Montrose 3765 (Melways 52 D7). Visitors and new members welcome.

President, Peter Adams.

A Checklist of Australian Native Orchid Hybrids
8th Edition - October 2005

The 8th Edition is now available through ANOS Council.
The cost is $20.00 plus $8.50 postage.
Once again there are sections detailing different aspects of native hybrids;
Section 1 - List of Recirded Hybrids.
Section 2 - Cross Reference List.
Section 3 - Naturally Occuring Hybrids.
Section 4 - Family Trees
Section 5 - *Dendrobium* Inheritance List.
Section 6 - Chromosome Counts In Australian Native Orchids.

All this in a 455 page booklet.
Around 125 pages larger than the 7th Edition of 1998.

Authors Micheal Harrison and Murray Corrigan list all the
Australian Native Hybrids to February 2005.
For your copy send a cheque or money order to:
The Treasurer
PO Box 318
Willoughby, NSW 2068

Late spring orchids in Western Australia.

Mike Duncan
PO Box 137
Heidelberg, Victoria, 3084

As the orchid season wanes in south east Australia and largely retreats to the alpine areas, it's still in full swing in Western Australia. With more than 370 recognised species in the south west land division, and a flowering period largely restricted to the August-December period, there are plenty of spectacular orchids still to see in late November. In particular, there are many late flowering *Caladenia*, *Diuris*, *Prasophyllum* and *Thelymitra* species. In 2005, I spent nine amazing days studying some of the more beautiful, bizarre and enormous orchids Western Australia has to offer.

While there are centres of diversity for *Caladenia* in both south eastern and south western Australia, Western Australia is really the home of the spider orchid, with more than 130 recognised species, varying from the tiny Dwarf Spider Orchid (*Caladenia bryceana*) to the 30 cm long flowers of the massive Giant Spider Orchid (*C. excelsa*). In late spring, tailed spider orchids such as the Albany Spider Orchid (*C. pholcoidea*) with its extremely long, thin, pendulous segments, and small, short-fringed labellum are just starting to flower between Augusta and Albany. As too is the widespread and common Christmas Spider Orchid (*C. serotina*) with its variably coloured flowers (wholly white through to large areas of red markings). It has a preference for winter-wet areas and swamp margins.

Late flowering clubbed spider orchids include the rare Lodge's Spider Orchid (*C. lodgeana*) with its broad, creamy-pink coloured labellum. It is quite a rare species, only known from the Augusta area. Conversely, the Karri Spider Orchid (*C. brownii*) with its striking green and reddish flowers, long labellum fringe, and distinctly clubbed sepals and petals, is widespread throughout the south west corner. The Green-comb Spiders Orchids are represented by the Ray Spider Orchid (*C. radiata*) which has a prominently fringed labellum and stiffly spreading segments. It occurs in low-lying swampy areas, and was found flowering while still standing in water at one site.

A number of *Diuris* species are still in flower in late spring, including the Purple Pansy Orchid (*Diuris longifolia*), the Cats Face Orchid (*D. filifolia*), and the Bristly Donkey Orchid (*D. setacea*), but a whole new group of swamp-loving species are just starting to flower. If you don your gumboots as the water starts to recede in the swamps and lakes of the south west corner, you can be rewarded with the stately sight of the large, robust stems of the Tall Donkey Orchid (*D. drummondii*) standing in the water. Its flowers are pale yellow and it has a broad, roundish labellum. In addition, on the fringes of the swamps the closely related Late Donkey Orchid (*D. emarginata*) is also coming into flower. Its plants are smaller and less robust, and the flowers are brighter yellow in colour.

While the diminutive, 10-15 cm tall Fragrant Leek Orchid (*P. suaveolens*) flowers in Victoria, there are some giant *Prasophyllum* species in flower in Western Australia. The Christmas Leek Orchid, (*Prasophyllum brownii*), the Swamp Leek Orchid (*P. drummondii*), the King Leek Orchid (*P. regium*), and even the Fringed Leek Orchid (*P. fimbria*) are all in flower. The average plant of each of these species is comfortably greater than 1 m, and in the case of *P. regium*, the average plant is about 1.5 m tall. All are larger than Victoria's biggest *Prasophyllum*, the (not so) Tall Leek Orchid (*P. elatum*). In one burnt swamp, I was soon surrounded by enormous *Prasophyllum* orchids in flower, and confronted by a huge *P. regium* plant of more than 2 m. Now, it's not very often that I have to look up to anything (some would say that's due to my generally poor attitude and lack of respect, but that's another story), but for the first time ever I encountered an orchid that was taller than myself (see picture page 144).

All *Thelymitra* species are beautiful, even the ones I can't identify. And there are plenty of Sun Orchids to look at during late spring in Western Australia. After an unseasonably cool spring in 2005, the Blue Lady Orchid (*Thelymitra crinita*) with its bluest of blue flowers, and the Scented Sun Orchid (*T. macrophylla*) were both still in good flower on the south coast. Both are large, robust species and very widespread and common throughout the south west. Around the Perth environs members of a complex of species related to the Leopard Orchid (*T. benthamiana*) also flower at this time of year. This is a spectacular group and includes the Chestnut Sun Orchid (*T. fuscolutea*) with its dark reddish-brown blotched flowers, the Star Sun Orchid (*T. stellata*), with its burnt-gold coloured flowers, with heavy dark brown blotching, and the Bronze Sun Orchid (*T. dedmaniarum*) with its bronzy-orange coloured, yellow-streaked flowers. In addition, they each have intricately ornate column appendages that can only be appreciated under magnification.

Each species on its own is spectacular, but to see all three is a feast for the peepers! Swamp-loving *Thelymitra* species also start to flower in late spring. The Plum Sun Orchid (*T. mucida*) with its distinctive hoary bloom on the top of the column can be seen flowering in swamps and roadside drains, as can the Swamp Sun Orchid (*T. cucullata*) with its small, stunning white flowers with attractive purple spots and blotches, and big furry yellow column lobe.

In summary, although it's hard to go past the 'showy' months of September and October for the ultimate orchid experience in Western Australia, please don't overlook the treasures of November.

A big thank you to all who helped make my visit a success, in particular: Tom and Glenys Blinco, Garry Brockman, Andrew Brown, Noel Clark, Pat Dundas, Ross and Margaret Fox, Christine Lock, Stuart and Mary Harris, Gloria Jackson, and Matz Dahlkamp. Much of the information in this article is from the 'good book' - *Orchids of Western Australia* by Hoffman and Brown.

-oOo-

TINONEE

ORCHID NURSERY

We stock a large range of Australian native *Dendrobium* and *Sarcochilus* species and hybrids from tube to flowering size.

We deflask and make available to you quality seedlings bred by some of the best hybridisers in the country.

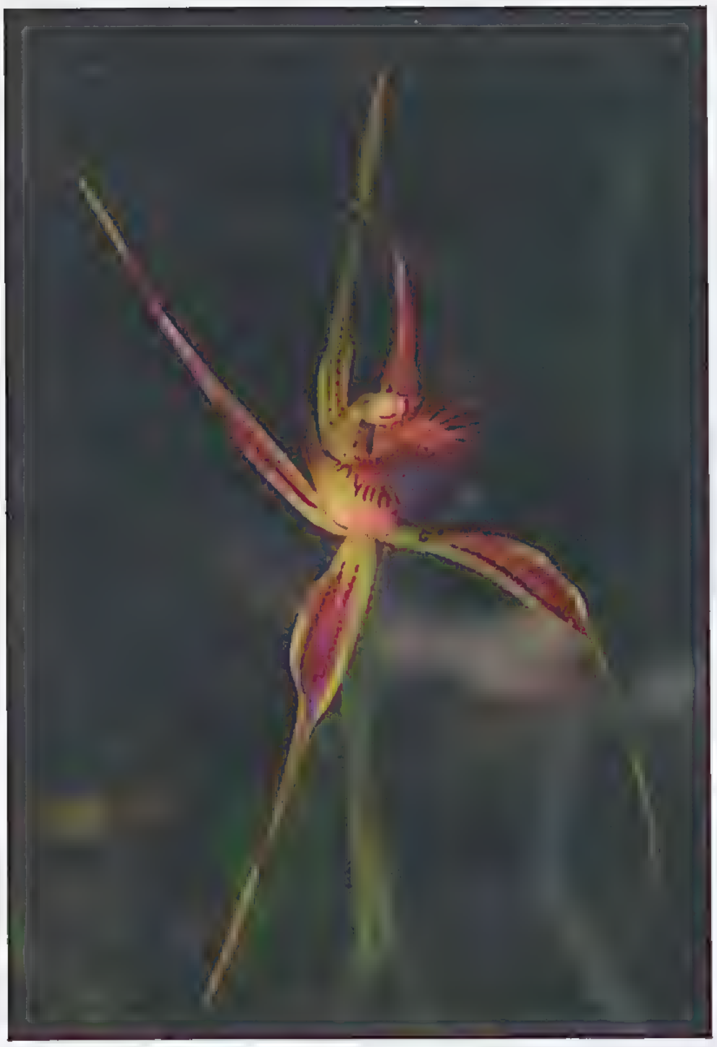
Ray Clement

768 Tinonee Road,
Tinonee, NSW 2430
email: clement@tpg.com.au

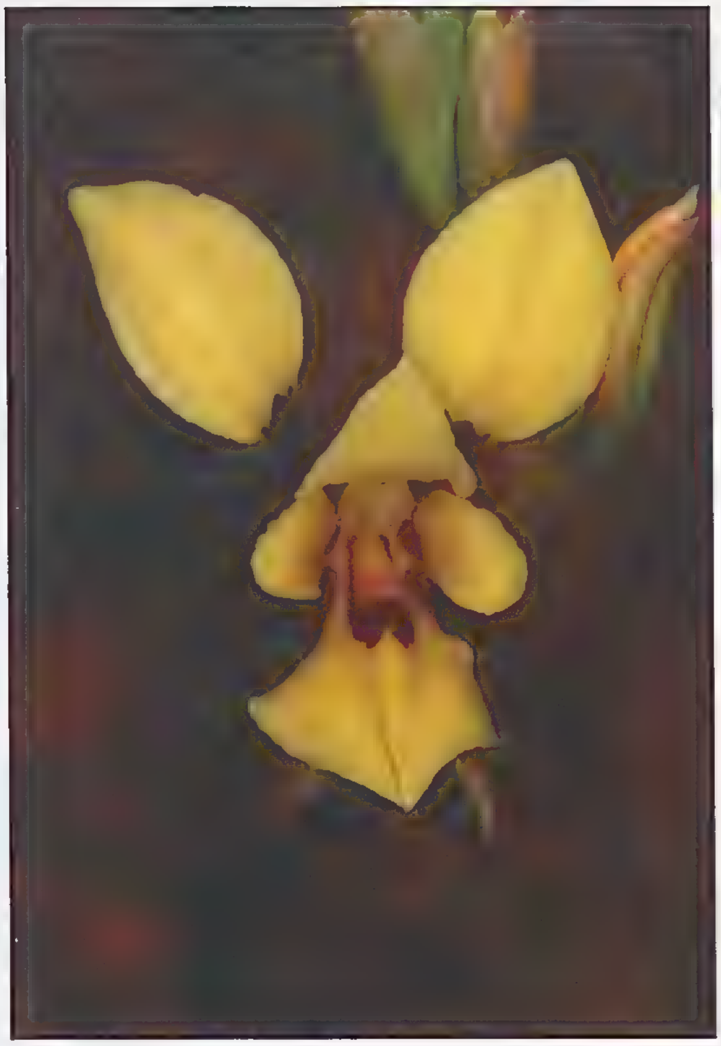
Free list available on request

Phone or Fax (02) 6553 1012

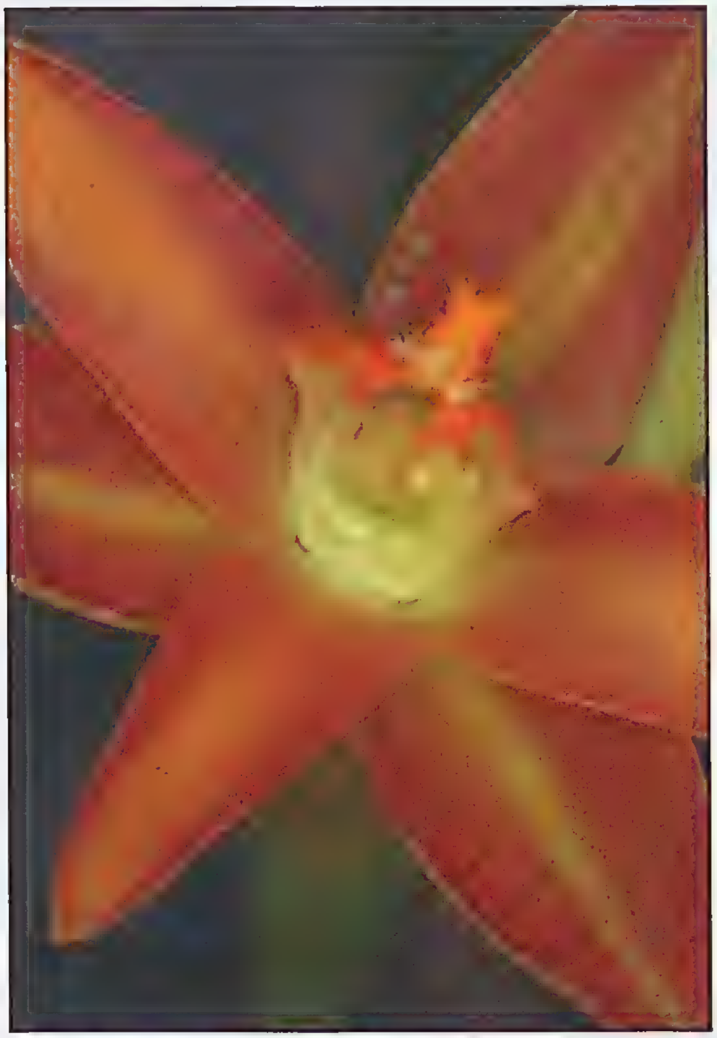
- Visitors Welcome -



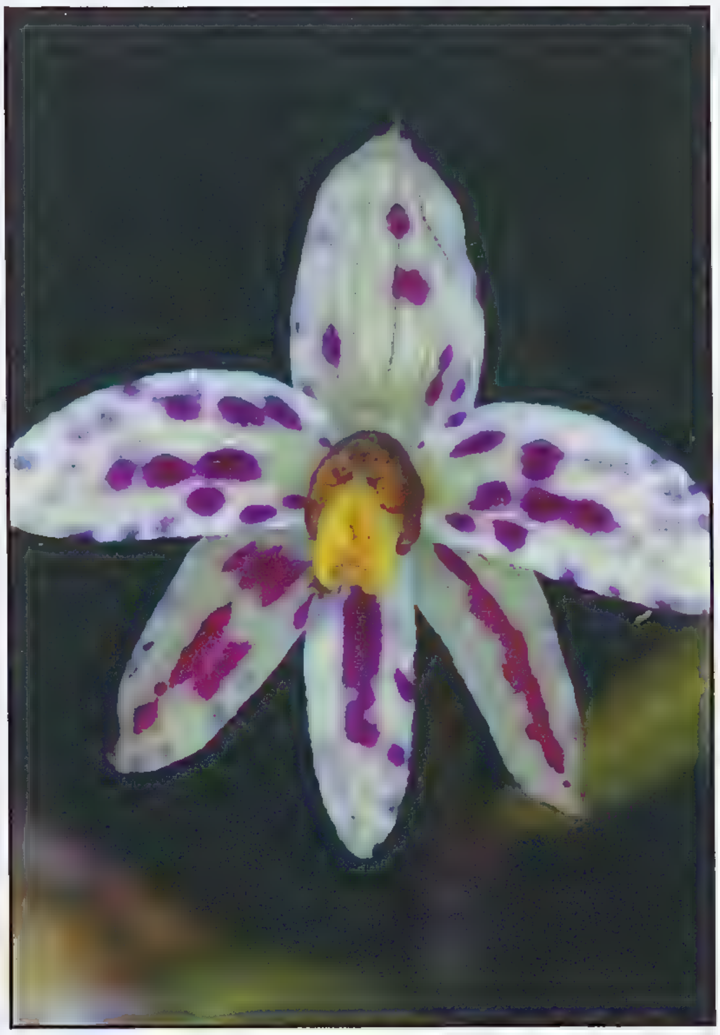
Caladenia brownii near Manjimup



Diuris emarginate near Rocky Gully



The ornate column structure of *Thelymitra dedmaniarum* in the Perth Hills



The delightful *Thelymitra cucullate* near Walpole Photos Mike Duncan

Morphometric Analysis of "*Dendrobium* Big Foot" reveals these plants are hybrids.

Dr. Peter B. Adams
School of Botany,
The University of Melbourne, 3010, Melbourne, Australia

Abstract

"*Dendrobium* Big Foot" is an attractive *Dendrocoryne* cross of debatable parentage. When fully grown, many plants have the vegetative and floral appearance of hybrids. Numerical analysis and morphological comparisons with *D. kingianum* plants of natural origin, and from line breeding, clearly indicate that most, if not all plants are **not** *D. kingianum*, and are of uncertain hybrid origin. It is strongly recommended that they be exhibited and judged as hybrids, and be clearly identified as such in breeding programmes to stop further contamination of pure line breeding of *Dendrobium kingianum*.

Introduction

"*Dendrobium* Big Foot" is a term in common use for the progeny of an intended cross *D. kingianum* 'Big Foot Mother' (parentage [Big Red (BR) X White Lip (WL)) X Lipstick]) X *D. kingianum* 'Big Foot Father' (a natural plant from Gloucester, New South Wales), first made by David Mitten in 1986. "Big Foot" refers to the prominent, often deep purple coloured, labellum seen in some plants. The first flowering seedlings showed considerable variation in vegetative form and flowers, with some resembling superior floral forms of *D. kingianum*. Subsequently many individuals have grown to become very large, stout plants with large flowers of heavy substance, including silcockii colour forms (white flowers with purple labella), raising the possibility of the cross being an unintentional hybrid.

"*Dendrobium* Big Foot" plants currently in collections do not fit the descriptions and the reference base of measurements for hundreds of *D. kingianum* plants as outlined in *Dendrobium kingianum* - A Unique Australian Orchid (Adams and Lawson 1995). Plants of "*D.* Big Foot" were included in the book with some reservations, when many of the plants were just reaching mature flowering size.

In this study, well established computerized numerical analyses were used to conduct morphometric comparisons of plants of "*D.* Big Foot" obtained from the breeder, with *D. kingianum* plants collected in the wild, and with line bred *D. kingianum* plants and seedlings of "*D.* Big Foot" X *D. kingianum* produced by the author. This evidence was used to test whether "*D.* Big Foot" is a species or hybrid, and to support recommendations regarding its classification in show schedules, judging and breeding.

Methods

Selection of plant groups: A group of "*D.* Big Foot" plants was selected from the original cross by David Mitten to compare with *D. kingianum* 'Big Foot Mother', *D. kingianum* 'Big Foot Father', "*D.* Big Foot" X *D. kingianum* seedlings, *D.* Gillian Leaney 'Breeder' (a cross of *D. kingianum* X [*D. kingianum* X *D. speciosum*]), and a likely contender for the Big Foot pollen, as it was growing near the intended parent plants), and a group of line bred *D. kingianum* with similar flower size to "*D.* Big Foot". Most *D. kingianum* plants of natural origin are not directly comparable, as they usually have smaller, lower quality flowers. Twenty eight vegetative and floral characters were asessed or measured (Table 1) for numerical analysis. Voucher specimens are held in the author's private collection.

Table 1. Table of characters used in analysis

Vegetative characters

1. Pseudobulb length (cm)
2. Pseudobulb width at base (cm)
3. Pseudobulb width at apex (cm)
4. Number of segments on pseudobulbs
5. Number of leaves
6. Leaf length (cm)
7. Leaf width (cm)

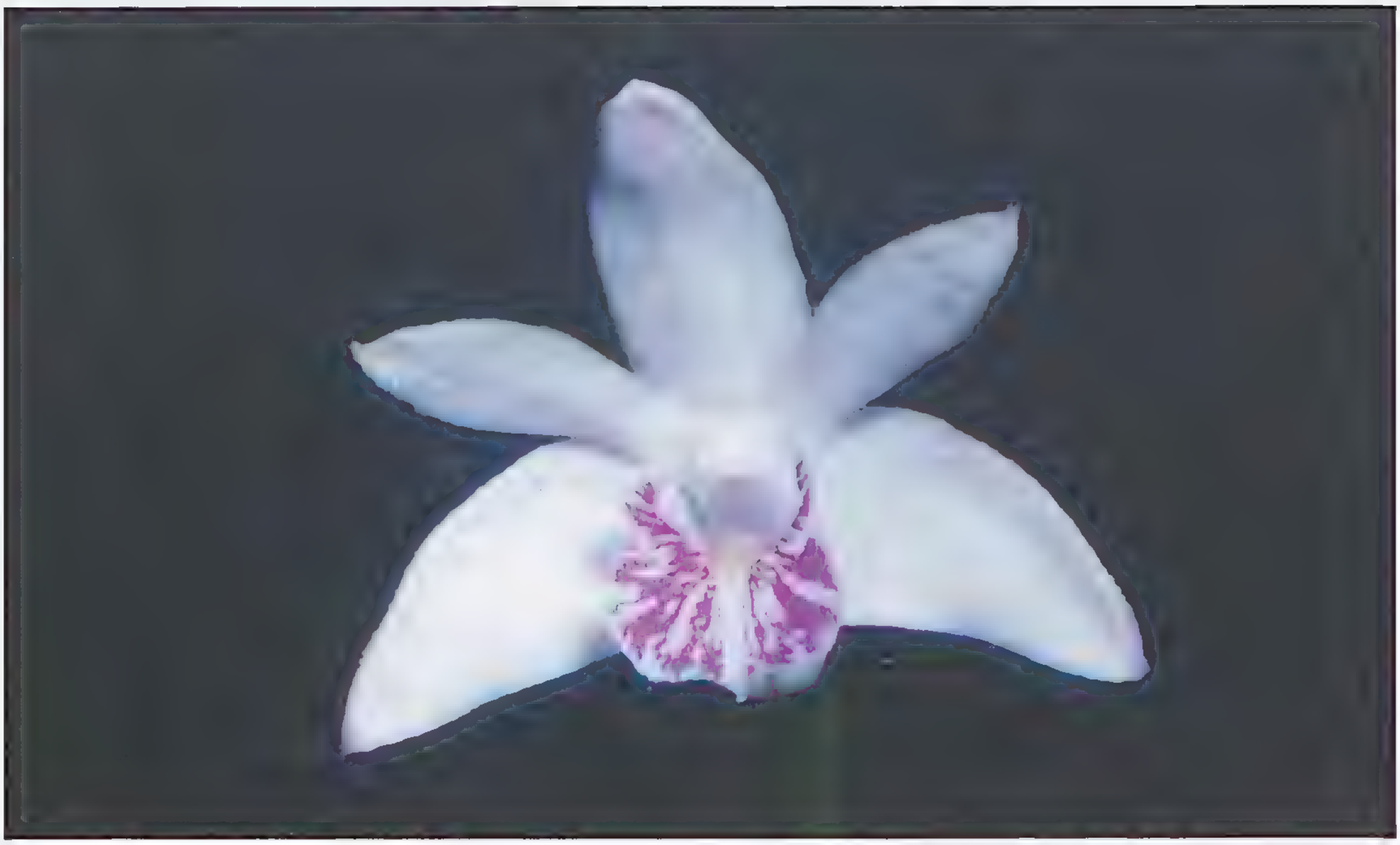
Floral characters

8. Number of apical racemes
9. Number of lateral racemes
10. Number of flowers
11. Rachis length (cm)
12. Peduncle length (cm)
13. Flower shape rounded (0) or triangular (1)
14. Flower length (dorsal sepal tip to lateral sepal tips) (cm)
15. Dorsal sepal length (cm)
16. Dorsal sepal width at base (cm)
17. Petal length (cm)
18. Petal width at base (mm)
19. Lateral sepal length (cm)
20. Lateral sepal width at base (cm)
21. Segments rounded (0) or acute (1) at apex
22. Pedicel length (cm)
23. Labellum mauve:white striped (0) or deep purple (1)
24. Flower substance light (0) or heavy (1)
25. Central white zone on midlobe absent (0) or present (1)
26. Labellum length (cm)
27. Midlobe width (cm)
28. Forelobe width (cm)

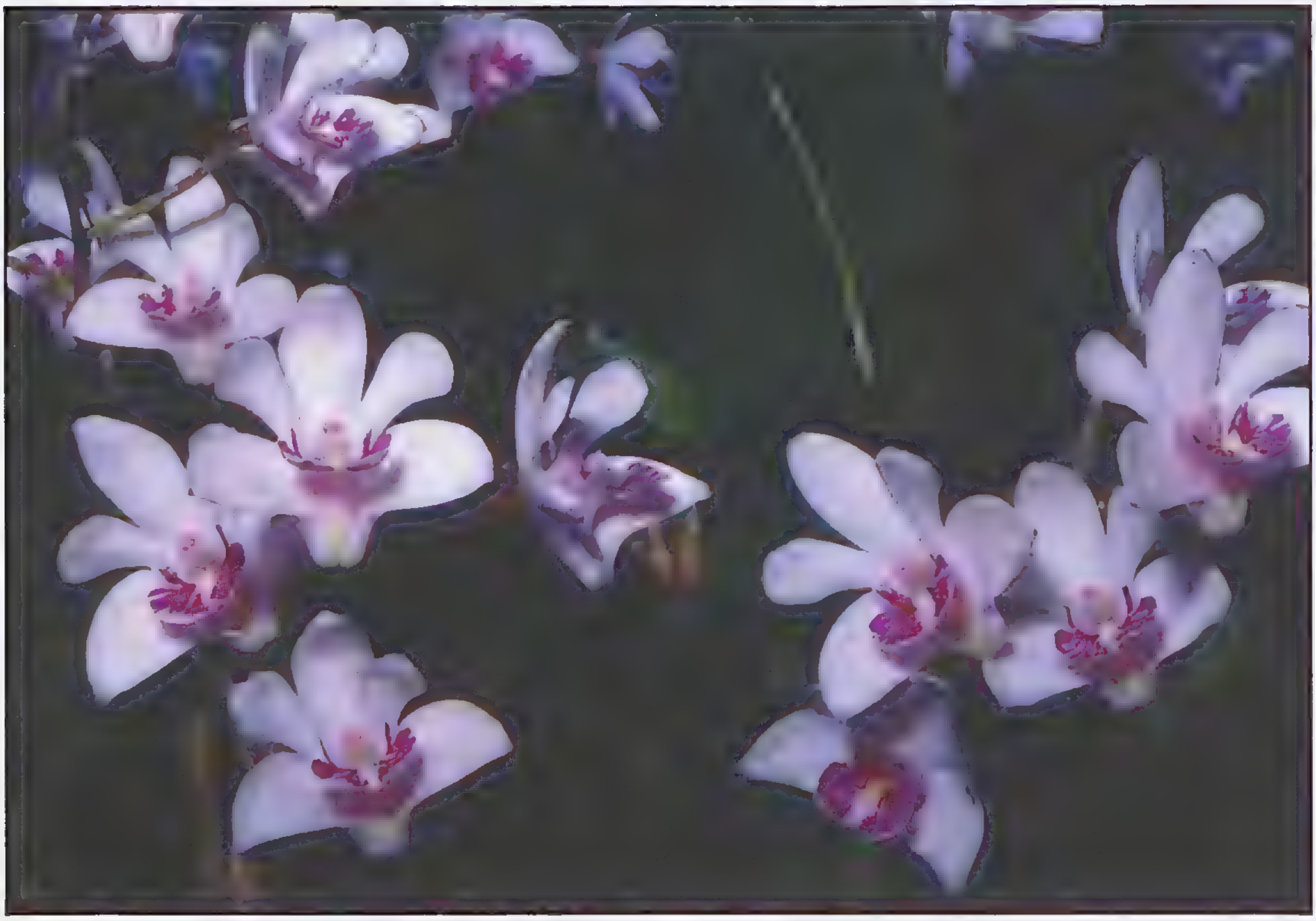
Numerical analysis: The following techniques, described in detail in Burke & Adams 2002, have been used for more than forty years and are often very effective in classifying individuals. Species and varieties of section *Dendrocoryne*, for example, are readily segregated into distinct sub groupings by these methods (Burke 1998, Adams *et al* 2006). Morphological data were range standardised, and a Manhattan Metric (MM) distance matrix (Sneath and Sokal 1973, Milligan and Cooper 1988) was calculated. The data set was subjected to numerical pattern analysis using the PATN package (Belbin 1988).

Cluster analysis: A specialised computer program processes all individuals according to their numerical characters listed in Table 1, and groups them according to relationships. If the groups are pure rather than mixed, this is strong evidence of distinct identity. Parents, hybrids and back crosses can be compared, and unknown entities assigned to groups. The unweighted pair-group arithmetic averaging (UPGMA) was used. A cluster intensity co-efficient (β=-0.25) was chosen because this setting is space-dilating, and affords maximum opportunity to separate subgroups.

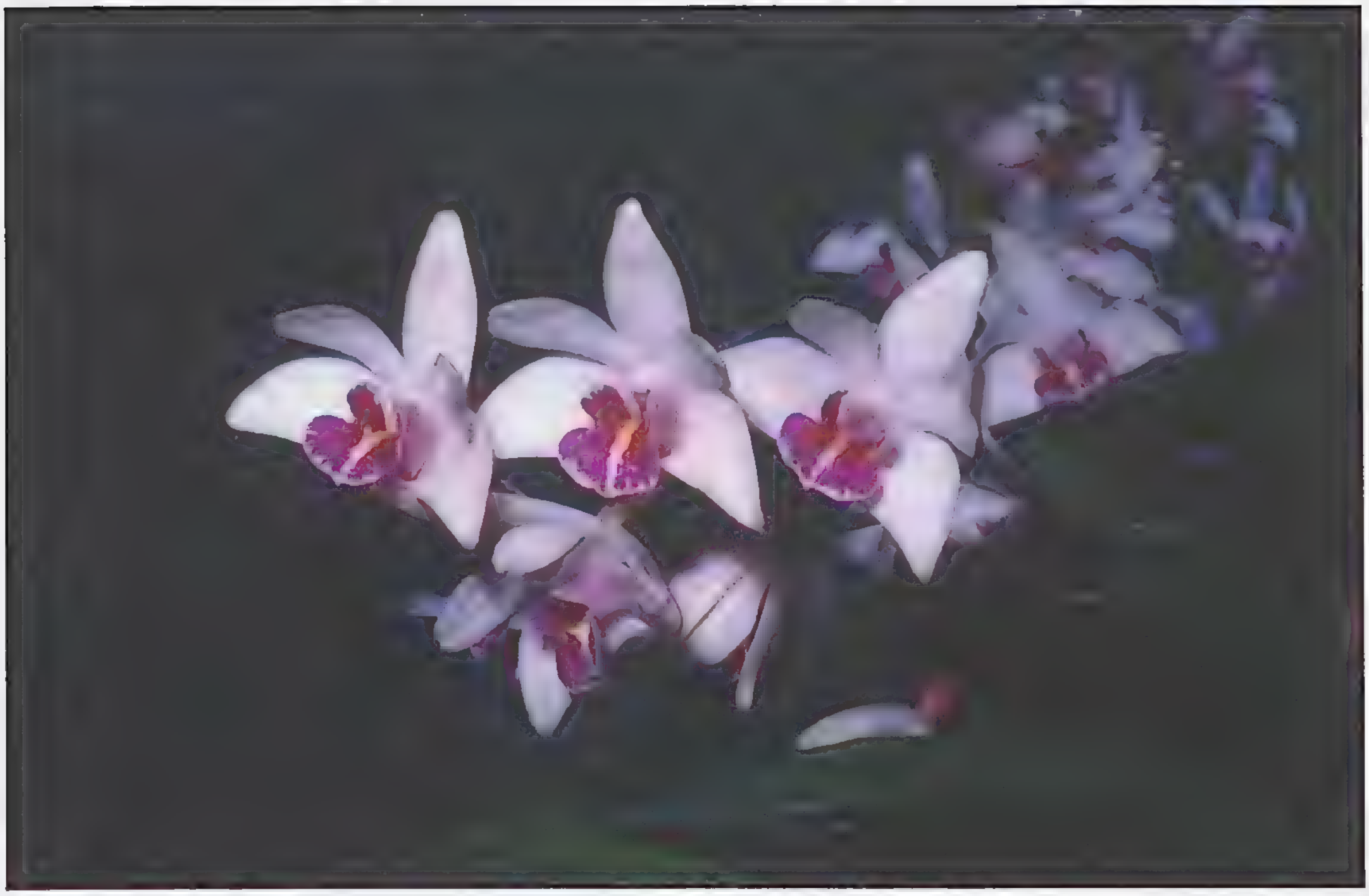
Figure 1 (Images pages 116 - 117)



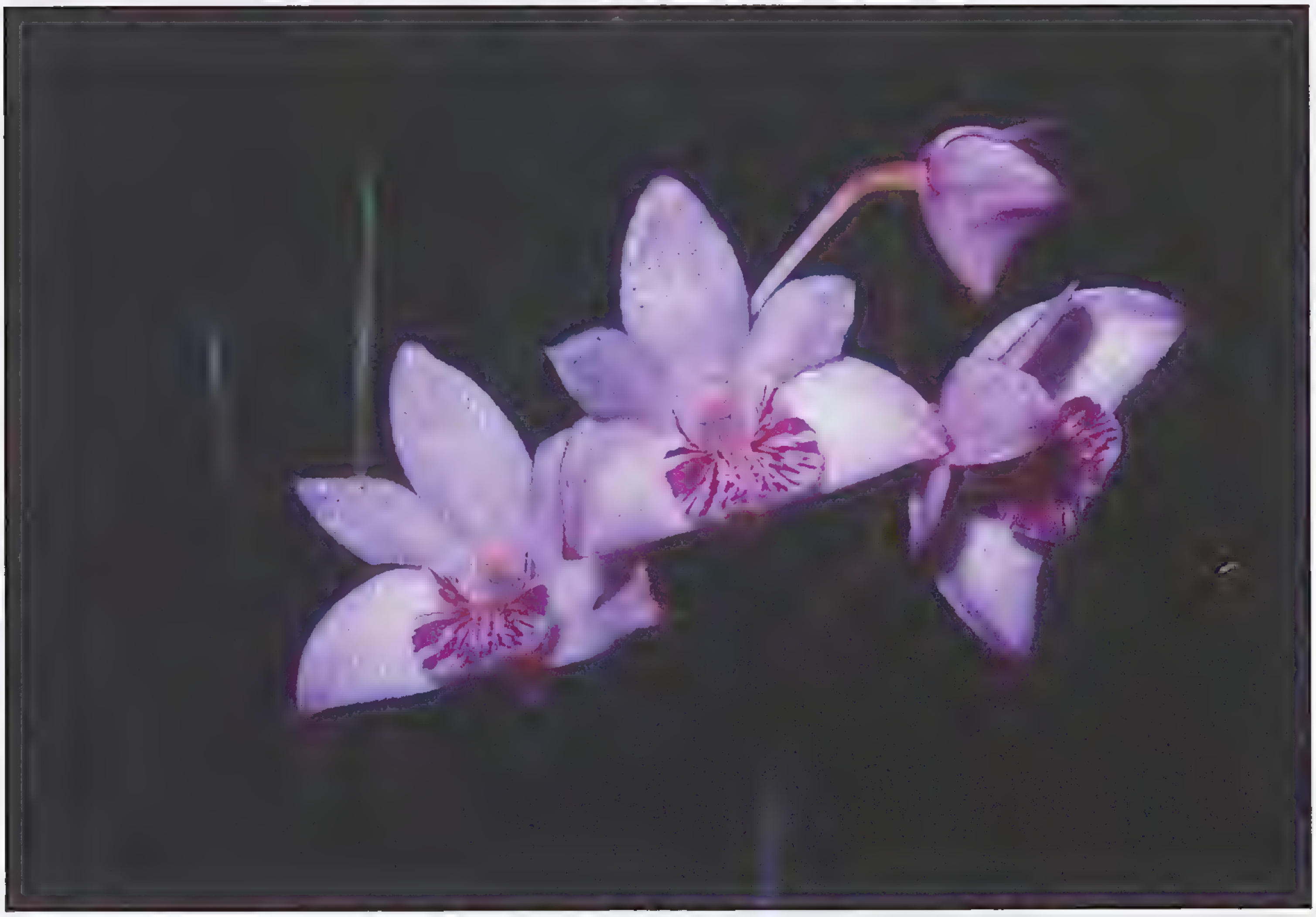
"*D.* Big Foot". Large flowered silcockii form. Photographed at David Mitten's, September 1991.



"*D.* Big Foot No. 1 (NRF)".



"*D*. Big Foot J.McM. No. 2" - silcockii form with white central strip on midlobe.



"*D*. Big Foot" Sapphire – mauve with purple/mauve striped labellum. Photos Peter Adams

Principle coordinate analysis: The distance matrix was used for ordination by principle coordinate analysis (PCoA) (Gower 1966). The numerical data is compared for individuals, and the relationships demonstrated by plotting the individuals on axes in three dimensions. They can be demonstrated in a 3D box, or by examining two axes at right angles. If individuals belong to a distinct group they cluster together. This analysis has the power to differentiate between some *Dendrobium* primary hybrids and their parents (Burke 1998). The natural hybrids *D.* X delicatum (*D. speciosum* X *D. kingianum*) and *D.* X delicatum X *D. kingianum*, occupied intermediate positions between the parent species in Burke's analysis. There is variation, and some natural hybrids tended to cluster toward the spread of *D. kingianum*. These results show the potential for the same methods to investigate the affinities and likely parents of "*D.* Big Foot".

Results and discussion

Observation of "*D.* Big Foot" plants and seedlings: Since advanced seedling stage, simple observation of the plant form and flowering of "*D.* Big Foot" seedlings has strongly suggested that they are hybrids (Figures 1, 2). Now that plants have reached specimen size, this has become more obvious. More than ten years ago, around 20 plants were examined at the home of the breeder (D. Mitten) when they were at mature pseudobulb height, and flowering with full sized racemes. The plants were robust, with wide-based, relatively non tapering pseudobulbs (Figure 2), long, strong racemes and peduncles expanded towards the base, resembling aerial growths – a feature I have rarely seen in *D. kingianum*. Plants bear a range of medium to large flowers with medium to heavy texture. About half were silcockii type or very pale mauve with purple lips (Figure 1). The remainder were splash or solid mauve. Flower size and characteristics ranged from medium-sized typical *D. kingianum*, to large flowers resembling *D.* Gillian Leaney 'Breeder' (Figure 2) and other hybrids. Many of the more striking silcockii colour forms have petals larger than is seen in *D. kingianum*, and a white zone down the middle of the labellum which is a very unusual characteristic for *D. kingianum* and a fairly common feature in hybrids.

The cross was made in both directions. *D. kingianum* 'Big Foot Mother' as pod parent produced medium to large flowered plants with silcockii, splash mauve, and mauve-coloured forms on robust plants, some of which closely resembled hybrids such as *D.* Gillian Leaney and *D.* Bicentennial Rose (*D.* Gillian Leaney X *D. kingianum*). These have tended to be retained by growers. When *D. kingianum* 'Big Foot Father' (Figure 2) acted as pod parent, plants were typical *D. kingianum* with smaller deep mauve to purple flowers, and these less desirable forms are often culled from collections. David Mitten has remade the cross using the original parents and at least three growers have flowered plants which have typical *D. kingianum* characteristics in all respects. None of the remake progeny resemble the original "*D.* Big Foot" cross.

Pseudobulb measurements: "*Dendrobium* Big Foot" plants have larger pseudobulb characteristics than *D. kingianum*, and are more typical of *D.* Gillian Leaney and other *Dendrobium* hybrids (Table 2). The range of pseudobulb apex widths of "*D.* Big Foot" does not overlap with the range for *D. kingianum* (natural or bred plants). Pseudobulb height and width at base, although partially overlapping with *D. kingianum*, are bigger for nearly all "*D.* Big Foot" plants. When "*D.* Big Foot" is crossed back to *D. kingianum*, the dimensions of the seedlings fit more closely with those of *D. kingianum* plants (Table 2), as expected; although some "*D.* Big Foot" characteristics, such as stout, relatively non-tapering pseudobulbs, and large cupped flowers, may still be apparent.

Table 2: Pseudobulb characteristics

Dendrobium plants	Pseudobulb height (cm)	Pseudobulb basal width (cm)	Pseudobulb apex width (cm)
"*D*. Big Foot"	15.6-28	1.7-2.7	0.75-0.9
D. kingianum line bred	7-16.5	1.6-2.0	0.55-0.74
D. kingianum naturals	4-60 (usually 7-15)	0.9-1.9	0.2-0.65
D. kingianum 'Big Foot Father' (claimed pollen parent)	12.7	1.4	0.5
D. kingianum 'Big Foot Mother'	8.0	1.3	0.4
D. Gillian Leaney 'Breeder' (possible pollen parent)	18.5	1.75	0.8
"*D*. Big Foot" X *D. kingianum*	10-14	1.4-2.0	0.45-0.8

Cluster analysis: "*Dendrobium* Big Foot" plants formed a distinct group with *D*. Gillian Leaney 'Breeder', except for one plant which clustered with a group of bred *D. kingianum* and *D. kingianum* 'Big Foot Father' (Figure 4). These results indicate that most, if not all, "*D*. Big Foot" are not seedlings of *D. kingianum*, and share characteristics with hybrids, for example, *D*. Gillian Leaney 'Breeder'.

Principle coordinate analysis (PCoA): "*Dendrobium* Big Foot" plants cluster separately from all *D. kingianum* plants and from the cross "*D*. Big Foot" X *D. kingianum*, except for one plant which clusters with line bred *D. kingianum* (Figure 5). Five of the six "*D*. Big Foot" plants group with *D*. Gillian Leaney 'Breeder', and all but one "*D*. Big Foot" separate from line bred *D. kingianum*. This "*D*. Big Foot" may be an outlier with predominantly *D. kingianum* phenotype, or a plant of the original cross intended.

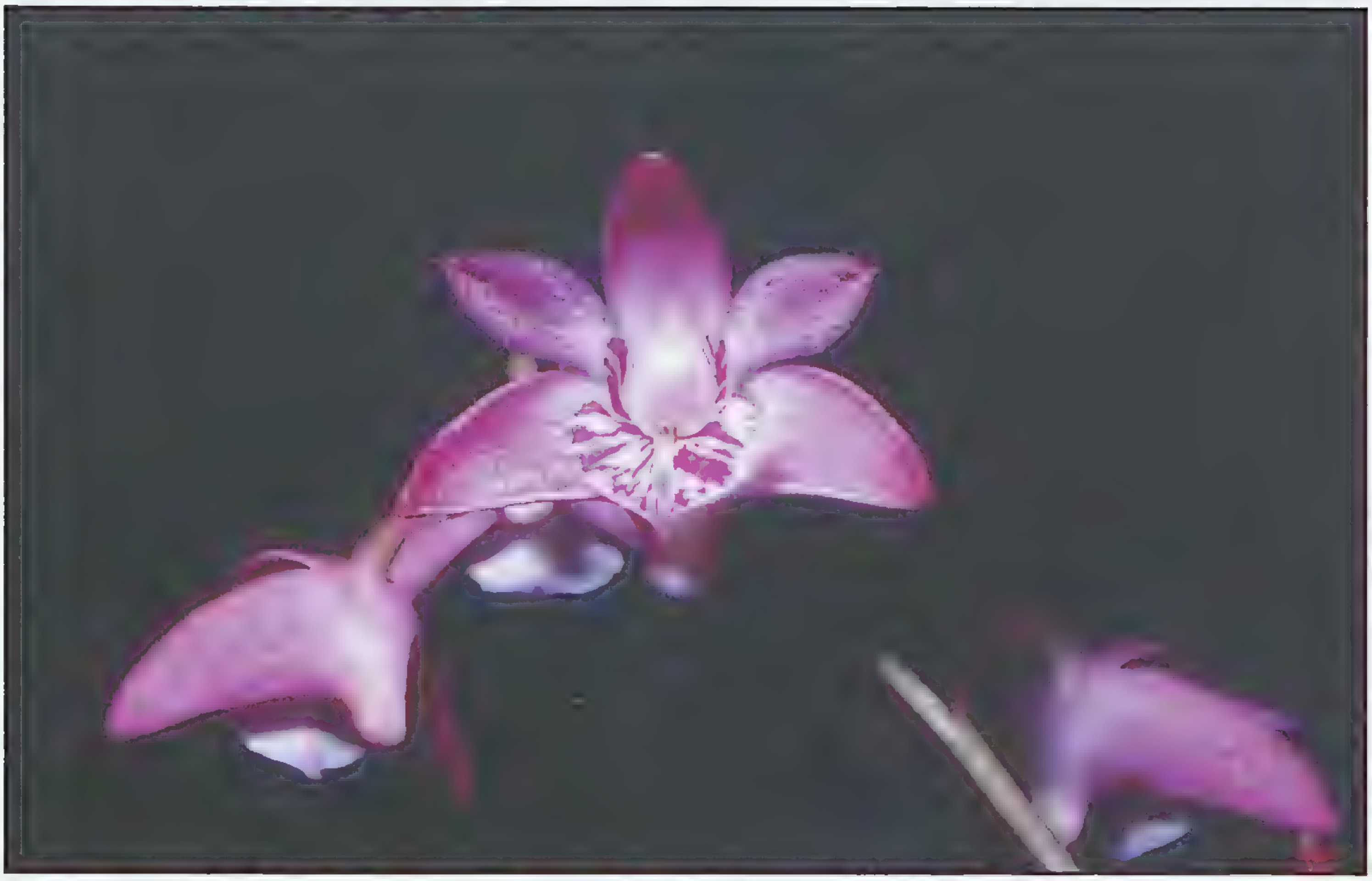
Dendrobium kingianum 'Big Foot Father' ordinates separately from all groups, including where other naturally occurring Gloucester kingianums are located in ordination space. *Dendrobium kingianum* 'Big Foot Mother'ordinates at one end of the group of "*D*. Big Foot" X *D. kingianum*. The predicted position for *D. kingianum* 'Big Foot Mother' X *D. kingianum* 'Big Foot Father' would be the lower left quadrant of Figure 5. No "*D*. Big Foot' plants ordinate between *D. kingianum* 'Big Foot Mother' and *D. kingianum* 'Big Foot Father', strongly suggesting that "*D*. Big Foot" does not result from this cross.

General discussion

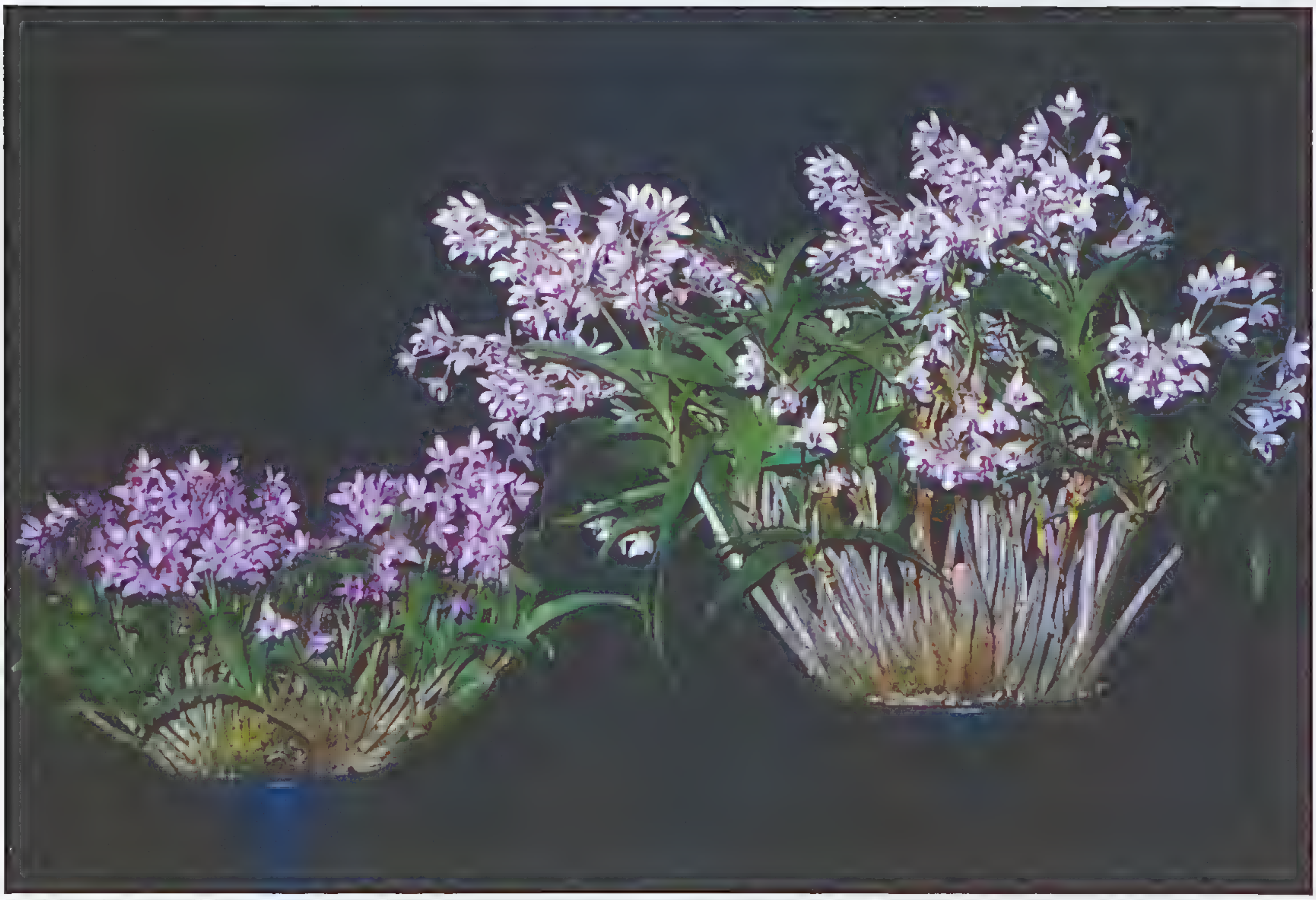
Visual observation and numerical analyses confirm that most "*D*. Big Foot" plants do not fall into the range of characteristics typical for *D. kingianum*, and are a *Dendrocoryne* hybrid, possibly *D. kingianum* X *D*. Gillian Leaney. Pseudobulb measurements alone (Table 2) indicate that most "*D*. Big Foot" are not *D. kingianum*. A few plants closely resembling *D. kingianum* are expected for this cross. None of the line bred *D. kingianum* group (which included vigorous and large flowered plants) overlapped with "*D*. Big Foot" in the analysis, further confirming that other species as well as *D. kingianum* are involved in "*D*. Big Foot". Plants of a remake of the "*D*. Big Foot" cross meet descriptions of typical *D. kingianum* plants rather than "*D*. Big Foot". These findings and comparisons with *D. kingianum* described and illustrated in Adams and Lawson (1995) all support the conclusion that "*D*. Big Foot" is a hybrid.

Hybridizing errors can result from confusion of pollen, plants or seed capsules during

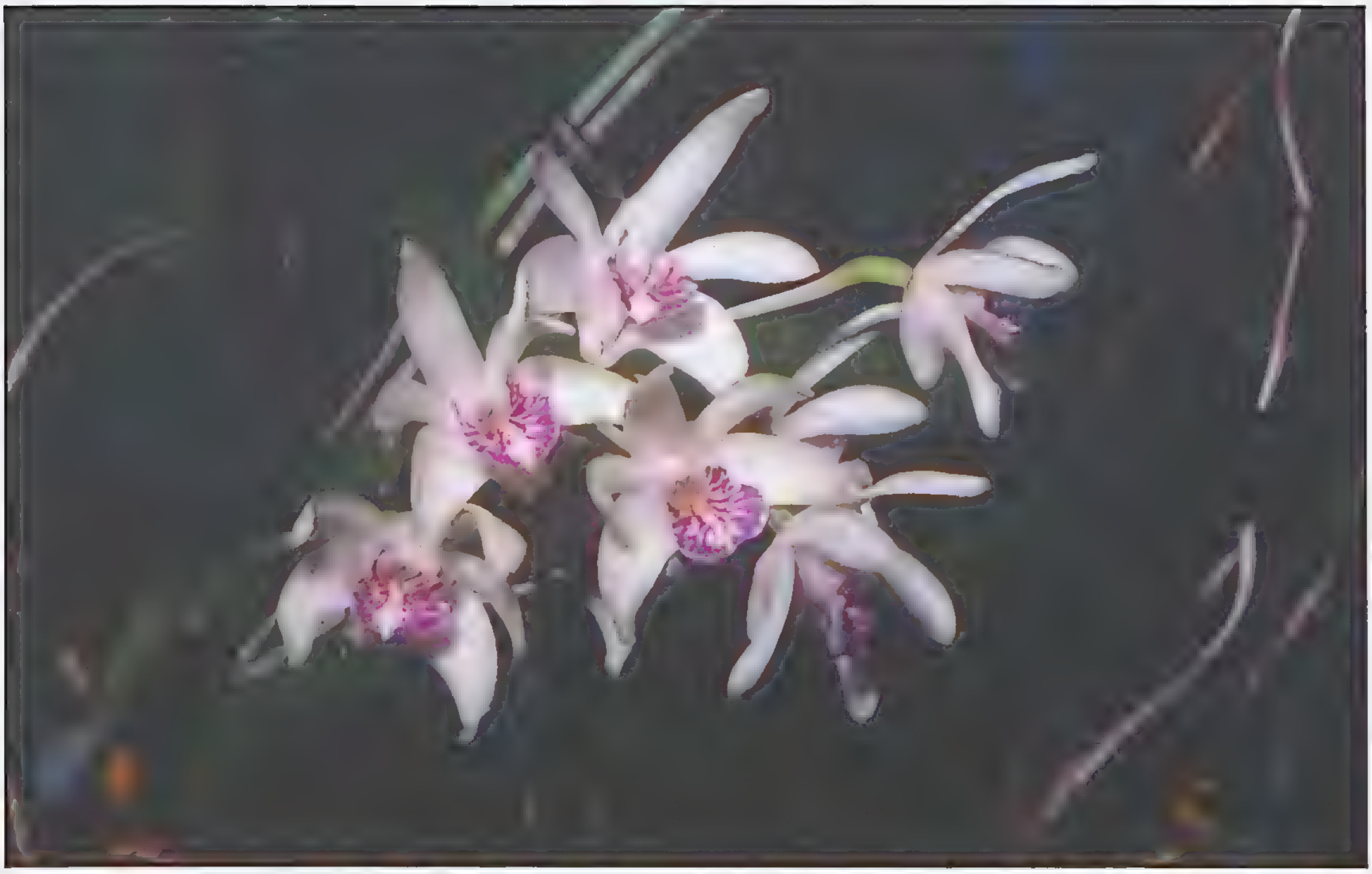
Figure 2 (Images pages 120 - 121)



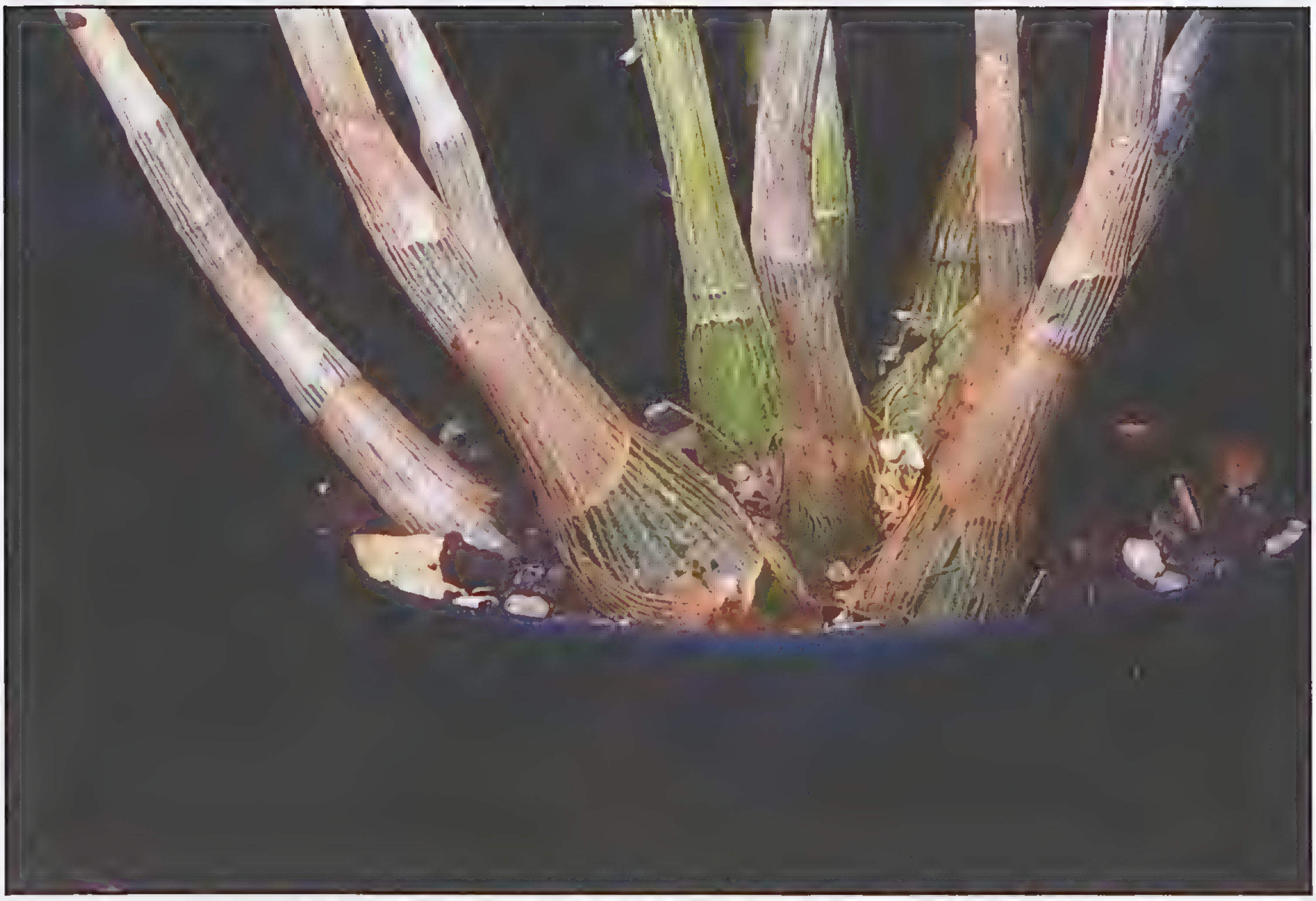
D. kingianum ‘Big Foot Father’, intended pollen parent of “*D.* Big Foot” cross. A typical Gloucester plant of medium size plant and flower.



D. kingianum ‘Norma’s Pink’ (a cross of *D. kingianum* ‘Cream 69 seedling No. 1’ X *D. kingianum* ‘Cream 69 Seedling No. 2’) (left), compared with “*D.* Big Foot” ‘J. McM. No. 2’ (right).



D. Gillian Leaney 'Breeder', a likely pollen donor in the "*D.* Big Foot" cross.



"*D.* Big Foot" 'Sapphire' showing very wide, stout bases of pseudobulbs.

Photos Peter Adams

pollination or flasking, and from labelling errors. Additional insect pollination from *D.* Gillian Leaney or another unidentified hybrid to *D. kingianum* 'Big Foot Mother' is the most likely explanation for the findings. Natural insect pollination occurs fairly commonly, and the breeding plants were not kept in insect proof houses.

The biggest flowered "*D.* Big Foot" plants, usually silcockii forms with deep purple labella, tend to be retained in collections and for competitive displays. The smaller, usually mauve flowered forms that are closer to *D. kingianum* are often culled. The cross was made by the breeder in good faith, and there are now outstanding seedlings of "*D.* Big Foot" in many collections.

Nomenclature: "*Dendrobium* Big Foot" is a term in common usage for plants that resemble the descriptions in this study and the photographs in Figures 2 and 3. Many current labels do not even show the original intended parents. It seems reasonable to continue use of the term for identification purposes only, recognizing that it can not be a registered hybrid, given current knowledge, because of its uncertain origin.

Judging and breeding: Some "*D.* Big Foot" plants have received awards as *D. kingianum*, e.g. *D. kingianum* 'Valdon' and 'Chrystal Ice'. All "*D.* Big Foot" plants should be judged as hybrids of uncertain parentage (if unknowns are permitted), and must not be used in line breeding of *D. kingianum*. With successive generations, the influence of the hybrid may become less recognizable (Figures 2, 3) but they are still hybrids, and the confusion increases each time these plants are used in breeding.

Acknowledgements

I thank David Mitten for his cooperation and help with this study and Jacinta Burke for performing the numerical analyses. Sheryl Lawson assisted with research and editing. I also thank a peer reviewer for constructive comments on the final draft.

References

Adams P.B., Burke J.M. & Lawson S.D. (2006) Systematic analysis of *Dendrobium* Schwartz section *Dendrocoryne* in the Australian region. Plant Systematics and Evolution (2006 in press).

Adams P.B. & Lawson S.D. (1995) *Dendrobium kingianum*: A Unique Australian Orchid. Publ. Central Queensland University Press.

Belbin L. (1988) 'PATN Analysis Package', (CSIRO Division of Wildlife and Rangelands Research, Canberra, Australia).

Burke J.M. (1998) A numerical analysis of *Dendrobium speciosum* Sm. Section *Dendrocoryne* (Orchidaceae). M.Sc. Thesis. James Cook Univ., Queensland, Australia.

Burke J.M. & Adams P.B. (2002) Variation in the *Dendrobium speciosum* (Orchidaceae) complex: a numerical approach to the species problem. Australian Systematic Botany 15:63-80.

Gower, J. C. (1966) Some distance properties of latent root and vector methods used in multivariate analysis. Biometrika 53: 325-338.

Milligan G. W. & Cooper M. C. (1988) A study of standardisation of variables in cluster analysis. J. Classification 5: 181-204.

Sneath P. H. A. & Sokal R. H. (1973) Numerical Taxonomy: The Principles and Practice of Numerical Classification. W. H. Freeman and Co. San Francisco.

-oOo-

Figure 4. Cluster Analysis (UPGMA β=-0.25) of *Dendrobium* groups using vegetative and floral characters.

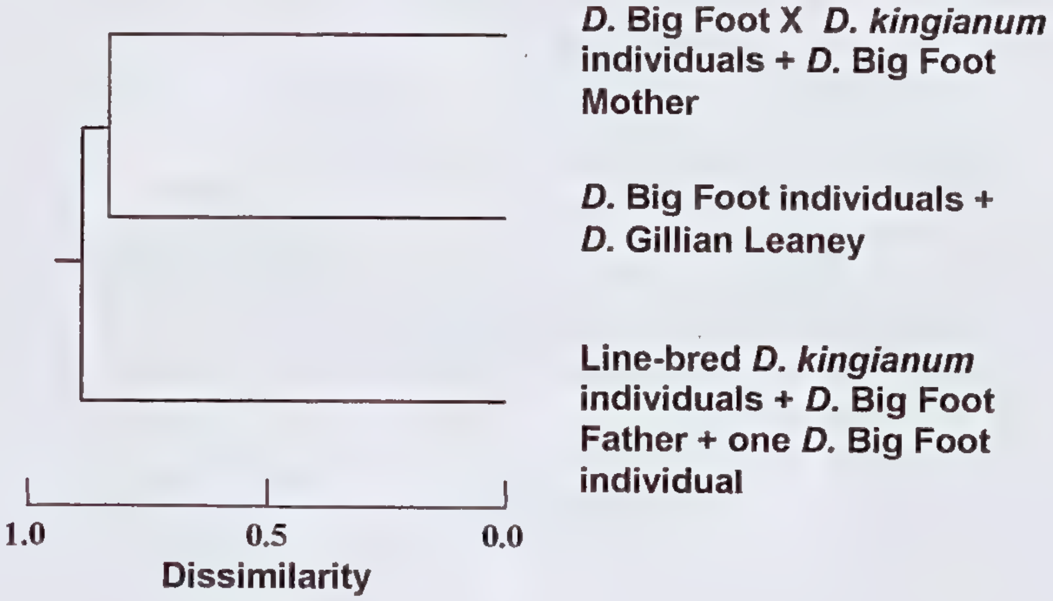

D. Big Foot X *D. kingianum* individuals + *D.* Big Foot Mother
D. Big Foot individuals + *D.* Gillian Leaney
Line-bred *D. kingianum* individuals + *D.* Big Foot Father + one *D.* Big Foot individual
1.0
0.5
0.0
Dissimilarity

Figure 5. Ordination from Principal Coordinate Analysis of *Dendrobium* groups using vegetative and floral characters.

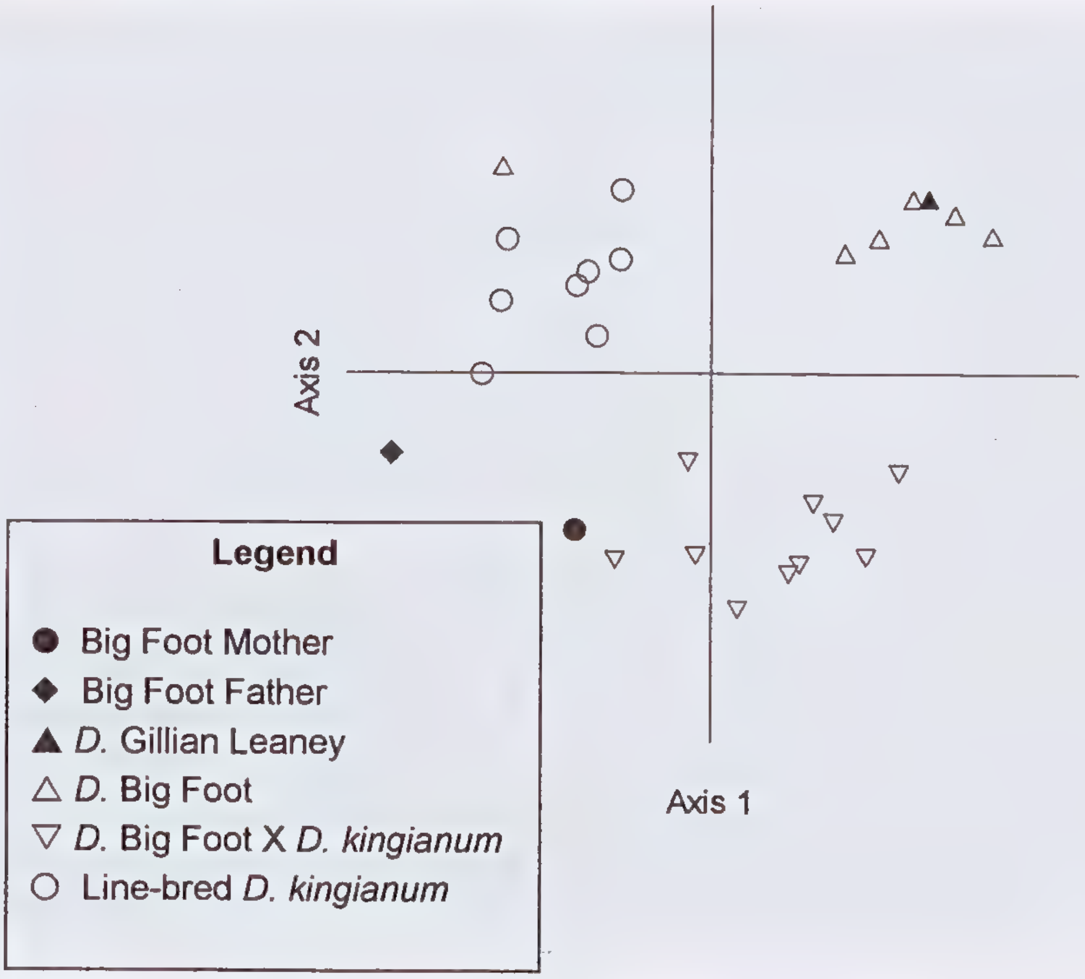
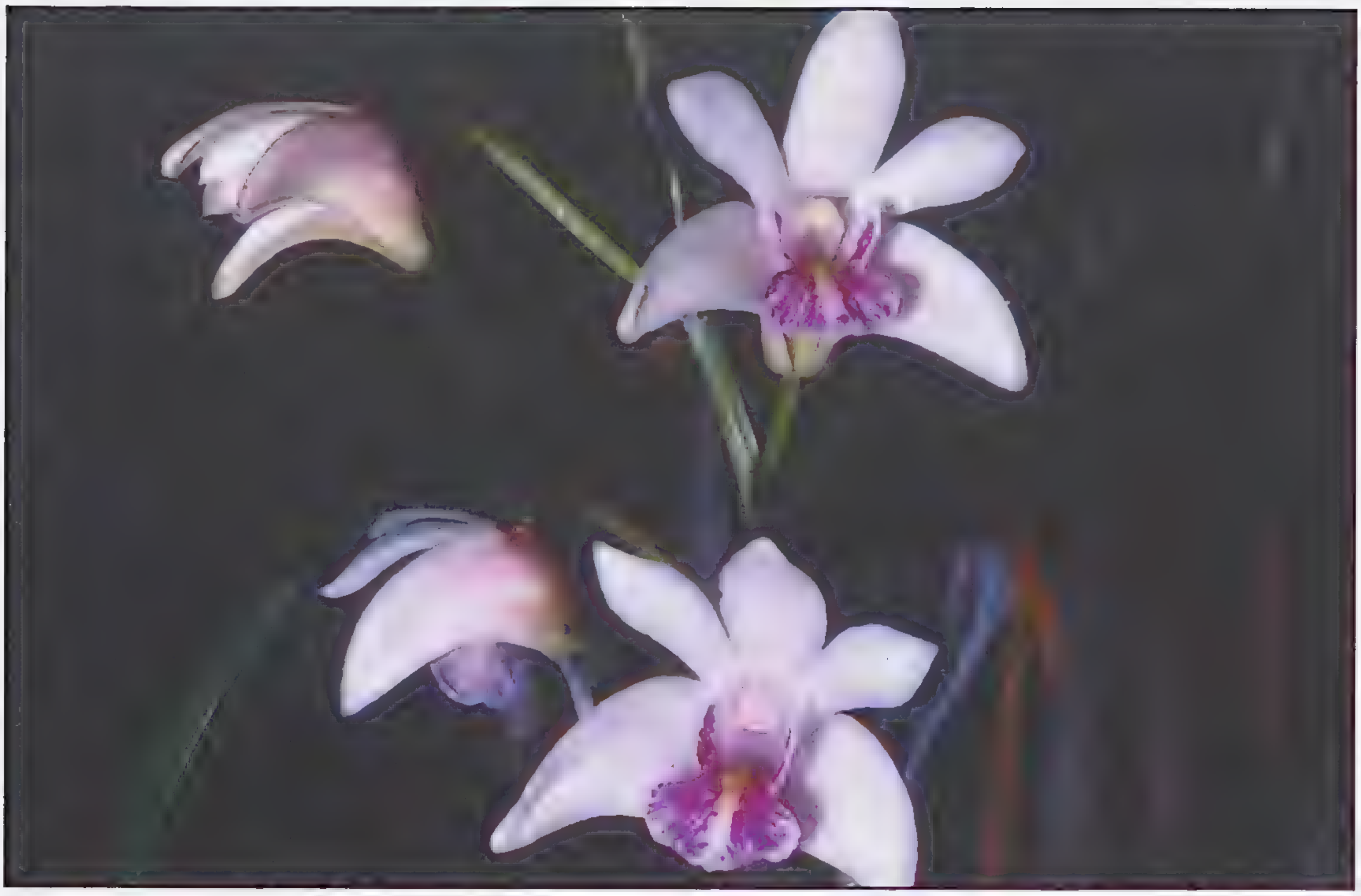
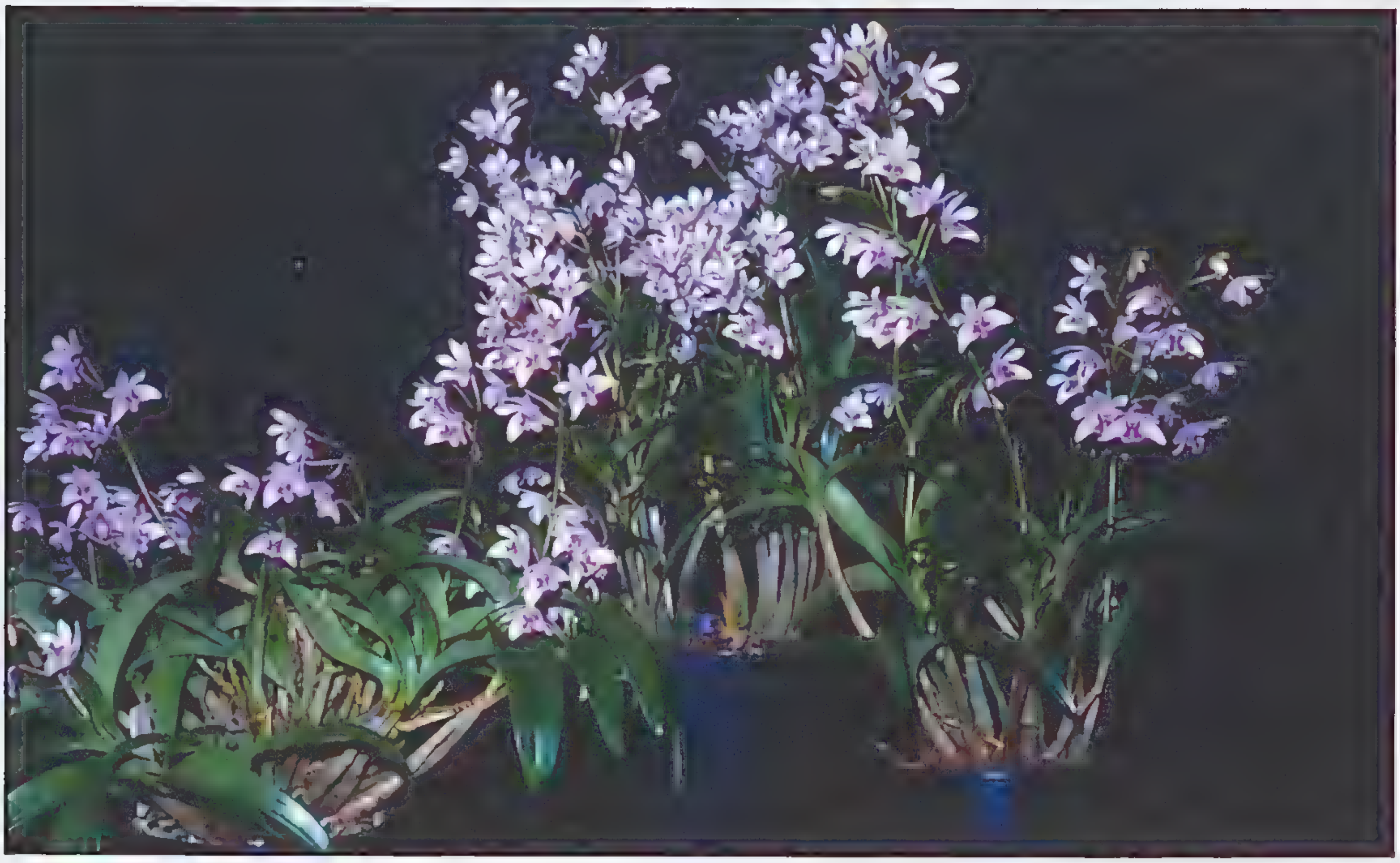


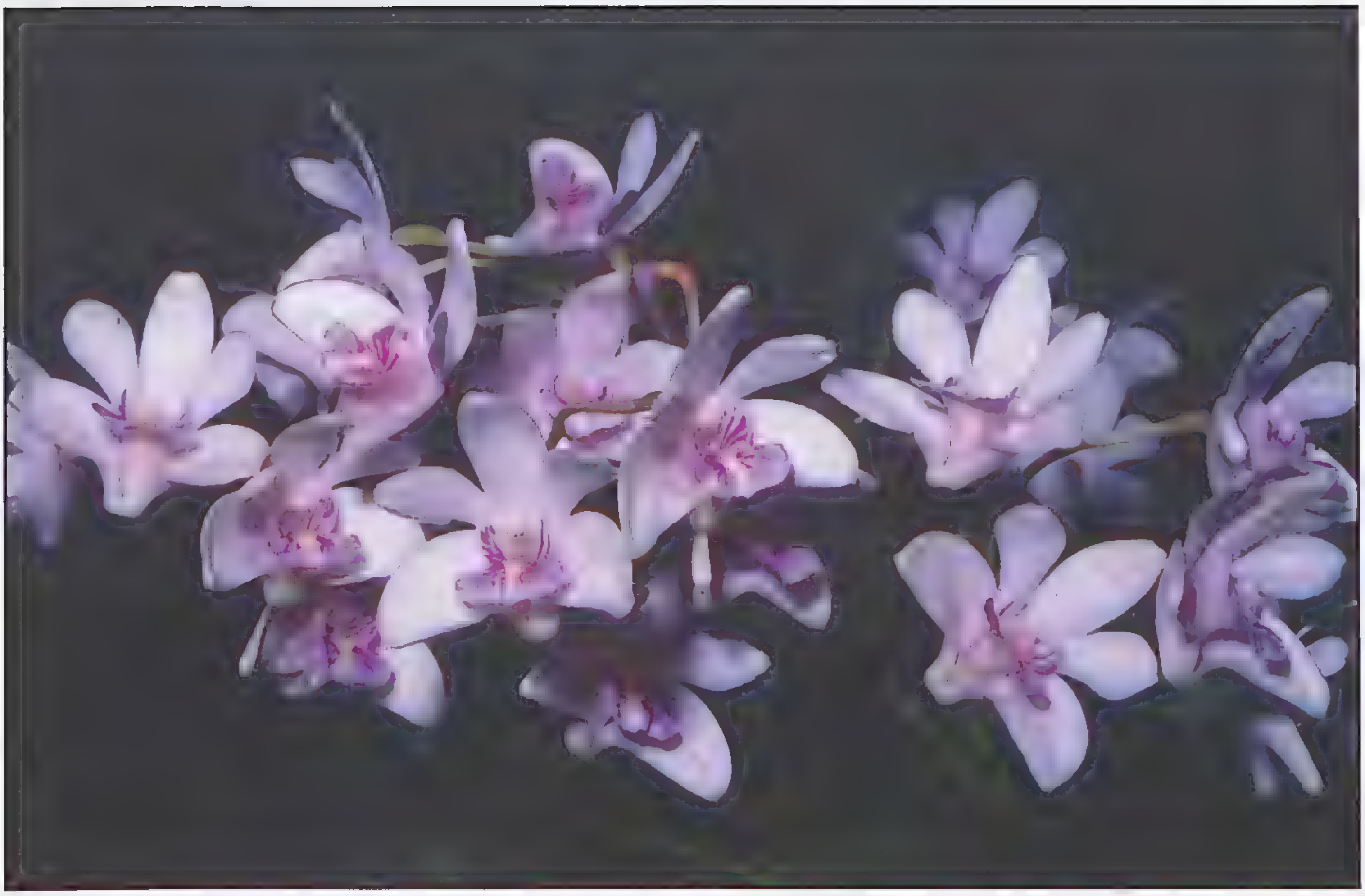
Figure 3 (Images pages 124 - 125)



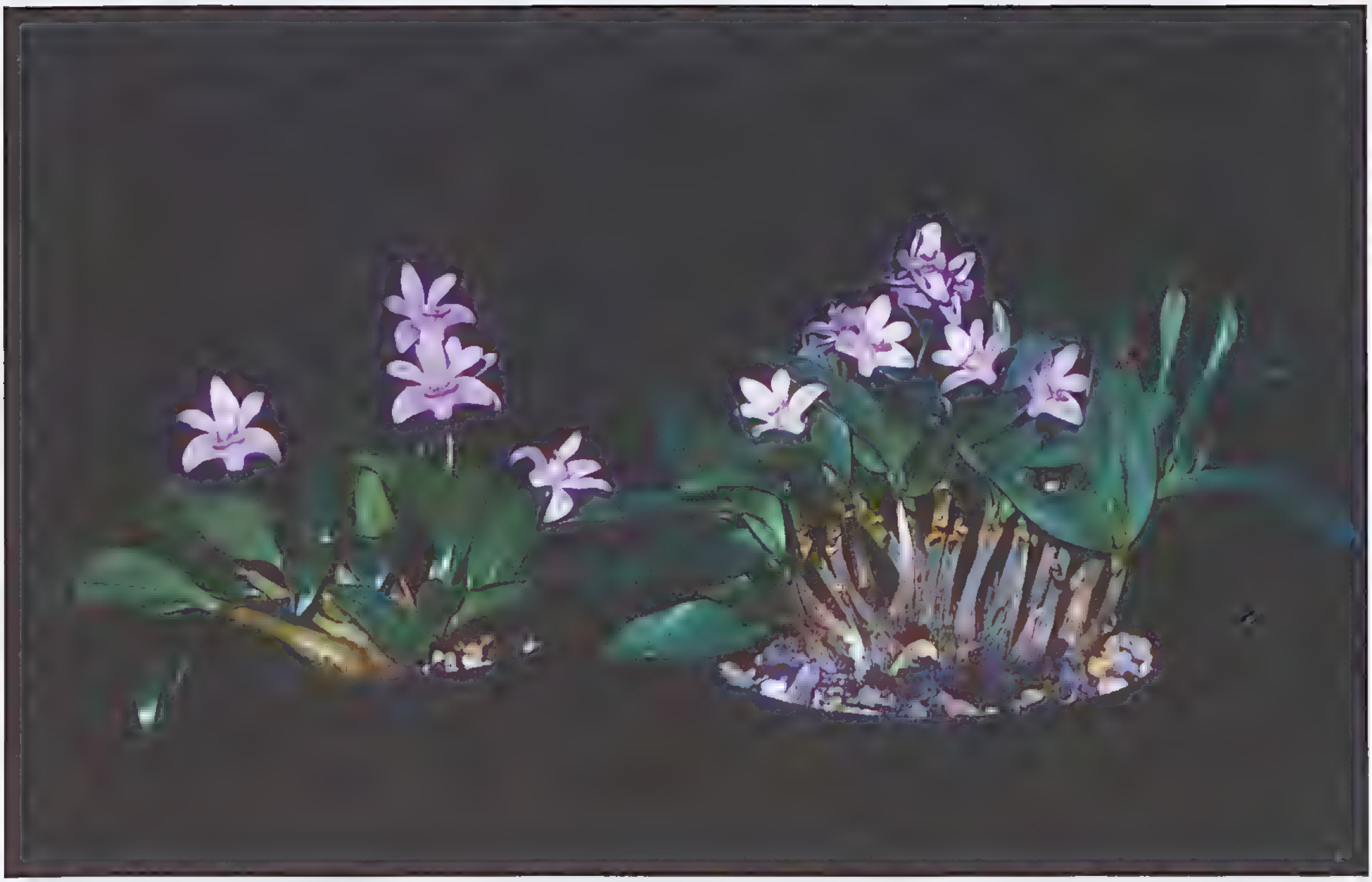
D. kingianum 'The Monster' X "*D.* Big Foot", showing dominance of "*D.* Big Foot".



"*Dendrobium* Big Foot" 'J. McM. No.1' (centre), compared with "*D.* Big Foot" 'No. 1 (NRF)' X *D. kingianum* 'Niagara' (left), with "*D.* Big Foot" dominance and *D. kingianum* 'The Monster X "*D.* Big Foot" 'J. McM. No.1' (right). The "*D.* Big Foot" X *D. kingianum* seedlings are shorter plants than "*D.* Big Foot", but still have their recognizable characteristics.



"*D.* Big Foot" X *D. kingianum* 'Niagara', with "*D.* Big Foot" dominance.



D. kingianum 'Tunstead's Pink' X *D. kingianum* 'Niagara' (left), and "*D.* Big Foot" X *D. kingianum* 'Niagara' (right). Plants and flowers are of similar size. Photos Peter Adams

17th AOC Australian Orchid Conference

Port Macquarie 2006

"Orchids in Paradise"

Port Macquarie Racecourse
18th till 23rd July 2006

Show set up on Tuesday 18th July
Judging Wednesday 19th July
Cocktail Party and Preview of Show for Registrants
Wednesday 19th July
Show pull down Sunday 2pm.
Banquet Dinner at Panthers Club
Saturday 22nd July

Admission

Adults	$6.00
Pensioners	$4.00
Children under 12 years	$2.00

Cedarvale Orchids

Specialist breeders of Australian Native Orchid Species and Hybrids

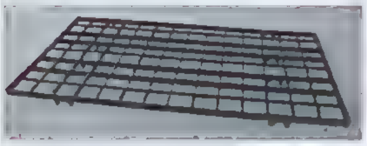
- Mail orders our specialty
- Phone prior to visiting
- Send S.A.E. for our current listing

Ross & Rhonda Harvey
16 Heather-Anne Drive
DRAPER QLD 4520
Telephone: (07) 3289 1953
email: cedarvaleorchids@bigpond.com.au

EASY BENCHING

New innovation. Light, strong and UV resistant this benching

$4 per panel



WHOLESALE INQUIRIES WELCOME

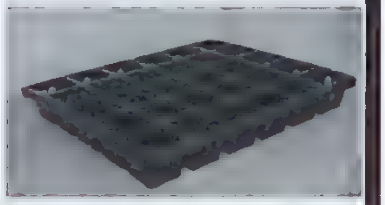
EASY ORCHIDS

3 Sussex St
Woodburn 2472
Ph: 02 6682 2635
WWW.EASYORCHIDS.COM

50MM INDIVIDUAL TUBE TRAY

First time in Australia. Forget the problems of fallen tubes

$4 each



WHOLESALE INQUIRIES WELCOME

POT TRAYS

Pot Trays A range of three desirable sizes designed to hold pots

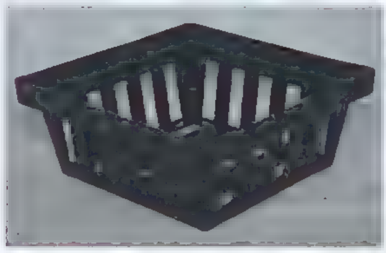
$4 each

WHOLESALE INQUIRIES WELCOME

BASKETS

Square vented pots

70mm	0.15c
80mm	0.20c
150mm	0.85c
200mm	$1.20

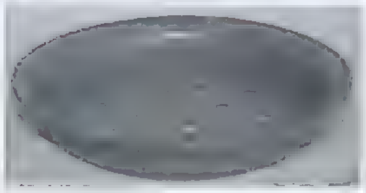


WHOLESALE INQUIRIES WELCOME

SHALLOW POTS

Specially designed Xtra shallow pots including the widest

260mm	$1.50 each
350mm	$2.95 each



WHOLESALE INQUIRIES WELCOME

EARTH TO JOY
Lloyd & Mandy Edwards
125 Isaacs Rd,Lorne NSW 2439
02 6556 9766

We are proud to let you know that our nursery is open to the public, 14 years in the making. Set in lovely surrounds with all amenities and a small art gallery. Buses welcome.

We breed and grow
Dendrobium and *Sarcochilus*. Seedlings and mature plants for sale.
Situated only 17 kms off the Pacific H'way between
Taree and Port Macquarie.
Open by appointment 1st July -30th November.
Please send S.A.E. for our catalogue.

DOWN UNDER NATIVE ORCHIDS
The home of TROPICOOL™ Hybrids
Specialists in Australian Native
Orchid Species & Hybrids
Plus select Hybrids & species
from around the globe
Phena & Brian Gerhard

P O Box 3630 WAMBERAL NSW Australia 2260
Ph: 02 43 854 552 Fax: 02 43 858 330 Mob: 0411 573 844
Email: brian_duno@bigpond.com
Website:- www.duno.com.au
Contact us for a free catalogue

ORCHIDACEOUS BOOKS
Specialist supplier of fine orchid literature

Large selection of new and
pre-owned titles available.
Browse our website at your leisure
www.orchidaceousbooks.com.au
or send for your catalogue.

Grahame & Margaret Muller
P.O. Box 4192, Tinana, Qld, 4650
Phone 07 4122 1251 Fax 07 4122 4539
email
books@orchidaceousbooks.com.au

AUSTRALIAN DECIDUOUS TERRESTRIAL ORCHIDS
Available as ...
Bare root plants: May - August
Dormant tubers: November - February
Flasks, all year

Easily grown species and hybrids from a range of genera including: *Caladenia*, *Chiloglottis*, *Corybas*, *Cyrtostylis*, *Diuris*, *Lyperanthus*, *Microtis*, *Pterostylis* and *Thelymitra*.

Send S.A.E. for listing and cultural notes.

NESBITTS ORCHIDS
PO BOX 72
WALKERVILLE, SOUTH AUSTRALIA 5081
Phone: (08) 8261 1550 Fax: (08) 8266 0372

MACQUARIE NATIVE ORCHIDS

Specialist breeders of Australian Native Species & Hybrids

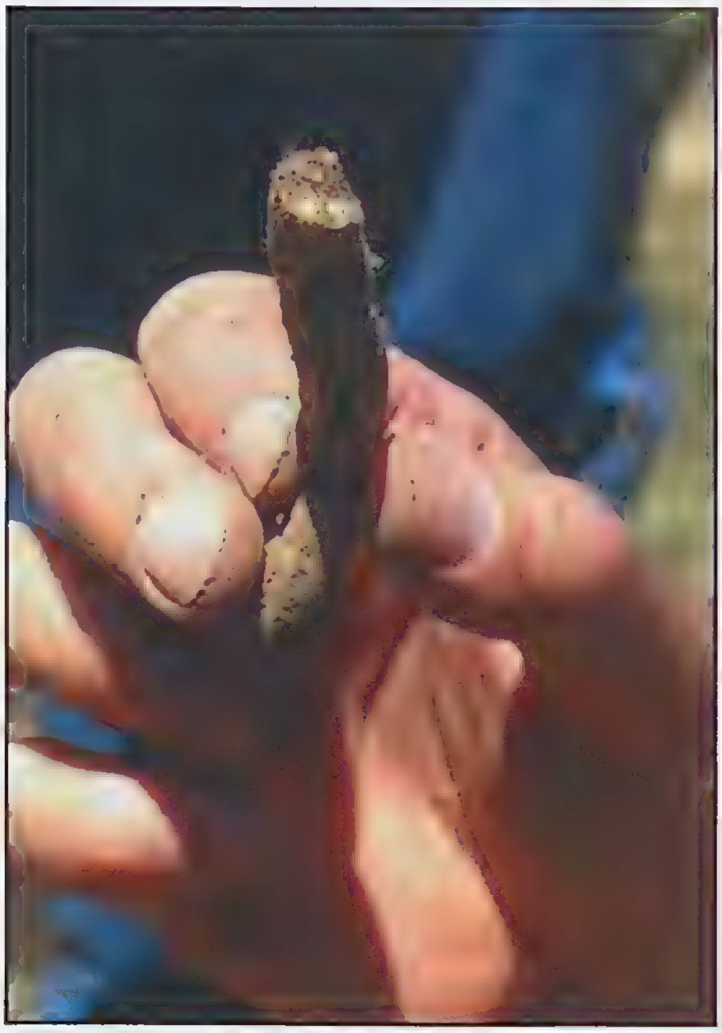
Michael and Roslyn Harrison
68 Howes Road
Nth. Wilberforce NSW 2756

☎ (02) 4576 3290

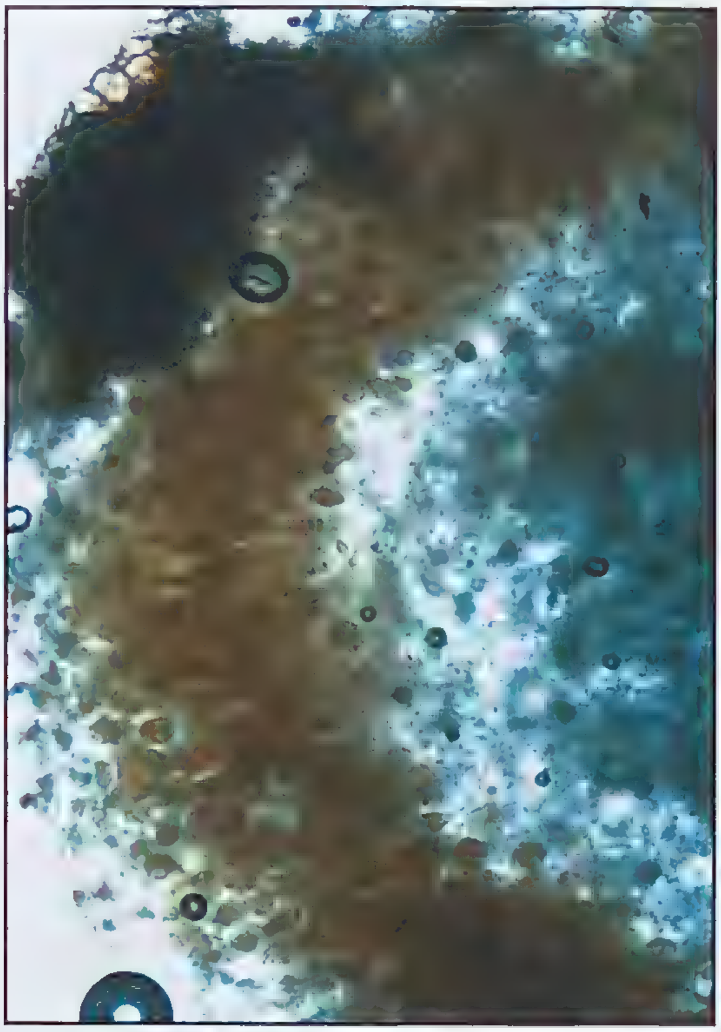
Inspection by Appointment
mwharrison@ozemail.com.au

Dipodium hamiltonianum or Yellow Hyacinth Orchid (Figures 1-2)

Photos John Dearnaley



Dipodium hamiltonianum root system. (Figure 3)



Brown fungal pelotons (coils) clearly visible in cross sections (Figure 4).

Recent studies of the biology of the Yellow Hyacinth Orchid – *Dipodium hamiltonianum.*

John D. W. Dearnaley
Department of Biological and Physical Sciences,
University of Southern Queensland,
Toowoomba QLD 4350.

Abstract

Dipodium hamiltonianum is a rare species of terrestrial orchid in eastern Australia. The fungi that reside in the orchid's roots are critical for nutrition of the plant. By extracting the DNA from whole colonised orchid roots and sequencing the fungal DNA present we have determined the identity of these fungi. These results strongly suggest that the orchid is a parasite on the trees it is usually found close to.

Key words

Orchidaceae, *Dipodium hamiltonianum*, Rare species, fungi, parasite.

Introduction

All orchids depend on soil fungi for seed germination in the natural state. Although most epiphytic orchids have a reduced dependency on fungi as adults, most terrestrial species continuously rely on soil fungi to some extent for their nutrition. Some terrestrial orchids have completely lost the ability to make their own food via photosynthesis and are heavily dependent on soil fungi to provide their nutritional needs via decaying plant matter or a living host. Examples of such genera in Australia include *Rhizanthella*, *Gastrodia*, *Erythrorchis*, *Epipogium* and *Dipodium*.

Dipodium hamiltonianum F.M. Bailey or Yellow Hyacinth Orchid is an impressive yellow flowering member of the *Dipodium* group of Australian terrestrial orchids (Figures 1 & 2). The orchid is endangered in Victoria with only hundred or so known individuals at various sites in the north east of the state (Department of Sustainability and Environment 2004). The range of the species extends to southern Queensland where it is considered uncommon (Riley and Banks 2002). Threats to the species include grazing, weed invasion, collecting and altered fire regimes (Department of Sustainability and Environment 2004). Being a highly myco-heterotrophic (fungus dependent) species, probably indirectly parasitic on tree roots (Bishop 2000; Jones and Jones 2000) the orchid is impossible to cultivate.

This article reports on an investigation into the identity of the fungi that reside in the roots of the yellow hyacinth orchid. As previous studies of fungi in other *Dipodium* species have shown these fungi to be largely unculturable (Bougoure and Dearnaley 2005) molecular biology techniques have been used to answer this question. It is envisaged that identification of the root fungi of the orchid will provide clues about the ecology of the species as well as indicators for improving its conservation status via *ex situ* growth.

Materials and Methods

Roots from four plants were sampled from northern New South Wales and south eastern Queensland (Figure 3). DNA was extracted from whole roots and amplified using fungal specific primers. After DNA purification, fungal sequences were inserted into plasmids in *Escherichia coli* bacteria and amplified via growth in nutrient broth. Following plasmid purification, fungal DNA was sequenced and compared with the GenBank database. For full methods see Dearnaley and Le Brocque (in press)

Results and Discussion

As is typical for *Dipodium* orchids (Riley and Banks 2002) the plants sampled were located at the base of, or close to mature tree species. The potential host species included

Eucalyptus prava, *E. youmannii*, *E. rossii* and *Callitris endlicheri*, indicating that the orchids are not specific in their tree preferences. Most of the roots sampled were heavily colonised, with brown fungal pelotons (coils) clearly visible in cross sections (Figure 4).

The results of the molecular biology investigations suggest that *D. hamiltonianum* is colonised by a specific group of fungi belonging to the Russulaceae family. DNA matches from GenBank included *Russula* species which have previously been shown to colonise roots of the related *D. variegatum* (Bougoure and Dearnaley 2005) as well as *Gymnomyces* spp. Both of these genera of fungi are commonly ectomycorrhizal on *Eucalyptus* (Bougher 1995) strongly suggesting that *Dipodium* orchids are indeed indirect parasites of tree species, i.e. they receive nutrients from living tree roots via a fungal connection. The observation that *Gymnomyces* fungi are found in *D. hamiltonianum* roots is interesting as these fungi, otherwise known as native truffles, are highly sought after food of marsupials such as potoroos and bettongs. As these marsupials play a role in fungal spore dispersal (Johnson 1996) it is enticing to conjecture that these animals play a role in the distribution of the orchid as well. Indeed it is noteworthy that few of these marsupials are now found in north eastern Victoria where the orchid is endangered while in north eastern New South Wales and south eastern Queensland both the orchid and marsupials are more secure.

What does this research mean for the conservation of *D. hamiltonianum*? Now that we have identified the fungi that reside in the roots of the plant we need to investigate the particular methods needed to culture these microorganisms. Once this is achieved it may be possible to grow orchids from seed in the laboratory, presumably together with seedlings of suitable tree species. A large collection of laboratory raised plants would enable release of plants to the wild as part of a species recovery plan, as well as production of seed to pass to other collections to ensure longevity of the species.

Acknowledgements

Thanks to the Australian Orchid Foundation for their financial support, the Queensland Parks and Wildlife Service and New South Wales National Parks and Wildlife Service for collection permits and Mr. Wayne Harris (Queensland herbarium), Mr. Peter Haselgrove (QPWS), Mr. David Jones (CPBR), Dr. Martine Maron (USQ), Mr. Pat McConnell (USQ), Mr. Ian Milinovich and Ms. Del Wham for help in locating the orchids. I thank Dr. Andrew Le Brocque for technical assistance.

Literature cited

Bishop, I. (2000) *Field guide to the orchids of New South Wales and Victoria*. University of New South Wales Press, Sydney.

Bougoure, J.J. and Dearnaley, J.D.W. (2005) The fungal endophytes of *Dipodium variegatum*. *Australasian Mycologist* 24: 15-19.

Bougher, N.L. (1995) Diversity of ectomycorrhizal fungi associated with eucalypts in Australia. In *Mycorrhizas for Plantation Forestry in Asia*. (Eds M. Brundrett, B. Dell, N. Malajczuk, G. Mingqin) ACIAR Proceedings No. 62, pp. 8-14. (ACIAR: Canberra.)

Dearnaley, J.D.W. and Le Brocque, A.F. (2006). Molecular identification of the primary root fungal endophytes of *Dipodium hamiltonianum* (Orchidaceae). In press. [you need to say where this is going to be published]

Department of Sustainability and Environment (2004) 'Action Statement No. 82, Yellow Hyacinth Orchid, *Dipodium hamiltonianum*', DSE website. <http://www. dse.vic.gov.au/>, Victorian Department of Sustainability and Environment (accessed 1 December 2005).

Johnson, C.N. (1996) Interactions between mammals and ectomycorrhizal fungi. *Trends in Ecology and Evolution* 11: 503-507.

Jones, D.L. and Jones B. (2000) *A field guide to the native orchids of Southern Australia*. Blooming books, Melbourne.

Riley, J.J. and Banks, D.P. (2002) *Orchids of Australia*. University of New South Wales Press, Sydney.

-oOo-

Rhizanthella omissa, a new species of Underground Orchid from south eastern Queensland.

David L. Jones and Mark A. Clements
Centre for Plant Biodiversity Research,
Australian National Herbarium,
G.P.O. Box 1600, Canberra, 2601,
Australian Capital Territory, Australia.

9226420

Abstract

Rhizanthella omissa from south eastern Queensland is described as new and illustrated.

Key Words

Rhizanthella omissa, *R. slateri*, new species, Queensland, Australian flora.

Introduction

The genus *Rhizanthella* currently contains two species, *R. slateri* from New South Wales and *R. gardneri* from Western Australia. The taxonomic status of a disjunct population of *R. gardneri* in south western Western Australia is currently under investigation (A. Batty pers. comm.) and another species, represented by two specimens from the Lamington Plateau in south-eastern Queensland, is here described as new.

Methods

All types or photographs of types relevant to this study have been examined. Measurements, morphological details and drawings of taxa have been obtained or prepared from either fresh specimens or herbarium specimens.

Taxonomy

Rhizanthella omissa D.L.Jones & M.A.Clem., sp. nov.; affinis *R. slateri* (Rupp) M.A.Clem. & P.J.Cribb, sed bracteis super rhizomatibus sparsis; bracteis floralibus longioribus (10–16 × 5–7 mm); sepalis et petalis sparse papillatis; apicibus sepalorum 3–5 mm longis; labello longioribus (c. 3 x 2 mm) et anguste ellipticis, differt.

Type: Queensland, Upper Nixons Creek, Lamington National Park, Nov. 1958, *G.Kouskos s.n.* (holo BRI).

Illustration: Page 333, Jones 1988 (photo of BRI specimen, as *R. slateri*).

Description: Subterranean leafless hemiparasite. Rhizome horizontal, 100-150 mm long, 10-15 mm wide, fleshy, white, sparsely clothed with fleshy bracts. Peduncle with scattered sterile bracts. Receptacle 20-25 mm wide, conical, fleshy. Floral bracts about 25, triangular, 10-16 mm long, 5-7 mm wide, overlapping, drab, white. Flowers inward-facing, 15-30 per head, tubular, 8-10 mm long, c. 5 mm wide, reddish, the outer ones in the head opening first. Perianth segments free, remaining in close proximity. Dorsal sepal ovate-oblong, 6.5-7.5 mm long, 2.5-3 mm wide, including an apical point about 3 mm long. Lateral sepals ovate, 8.5-10 mm long, 2.5-3 mm wide, asymmetric, including a projecting apical point 4-5 mm long. Petals oblong-ovate, 3.6-4 mm long, c. 1.5 mm wide, acuminate. Labellum on a stalk c. 1 mm long; lamina narrowly ovate-elliptical, c. 3 mm long, c. 2 mm wide, curved, fleshy, dark red, papillate; margins with extended hair-like papillae. Column c. 2.5 mm long, c. 1 mm wide.

Distribution and Ecology

Known only from a single collection in the Lamington National Park, south eastern Queensland at about 1200 m alt. The species was found growing in deep basaltic loam in tall forest dominated by eucalypts and large *Allocasuarina torulosa*, with a sparse shrubby understorey. The rainfall is about 1600 mm per annum, most falling during summer. Flowering period: November.

Recognition

Distinguished from *R. slateri* by its sparsely bracteate rhizomes, large triangular floral bracts (10-16 x 5-7 mm), sparsely papillate sepals and petals, sepals with attenuate tips 3-5 mm long and a narrowly ovate-elliptical labellum. By contrast *R. slateri* has densely bracteate rhizomes, short triangular floral bracts (6-8 x 2-3 mm), densely papillate sepals and petals, sepals with short acuminate tips c. 0.5-1.5 mm long and a broadly cordate labellum c. 2 x 2 mm. The attenuate tips on the sepals of *R. omissa* are very distinctive and protrude conspicuously from the flowerhead of the orchid (see page 333, Jones 1988).

Notes

Two flowering specimens of this species were located by Gus Kouskos in November 1958 while working on a track in the Upper Nixons Creek area of Lamington National Park. These specimens are preserved in the Queensland Herbarium (BRI) and remain the only collections of the species made to date.

Conservation Status

Poorly known but conserved in a National Park; suggest 1KC according to the criteria of Briggs & Leigh 1996.

Etymology

The Latin *omissa* – omit, omission (overlooked species).

Acknowledgements

We thank Laurie Adams for the Latin diagnosis and Karina Richards for reading the manuscript. David Jones expresses thanks to Bob Johnson, former Director at BRI for his assistance at all times and permission to examine the specimens of *Rhizanthella omissa* and dissect a flower.

Literature Cited.

Briggs, J.D. & Leigh, J.H. (1996). *Rare or Threatened Australian Plants*, Revised Edition. (CSIRO and Australian Nature Conservation Agency).

Jones, D.L. (1988). *Native Orchids of Australia*. Reed Books Pty Ltd, Frenchs Forest, NSW.

-oOo-

Orchids Australia
OFFICIAL PUBLICATION OF THE
AUSTRALIAN ORCHID COUNCIL

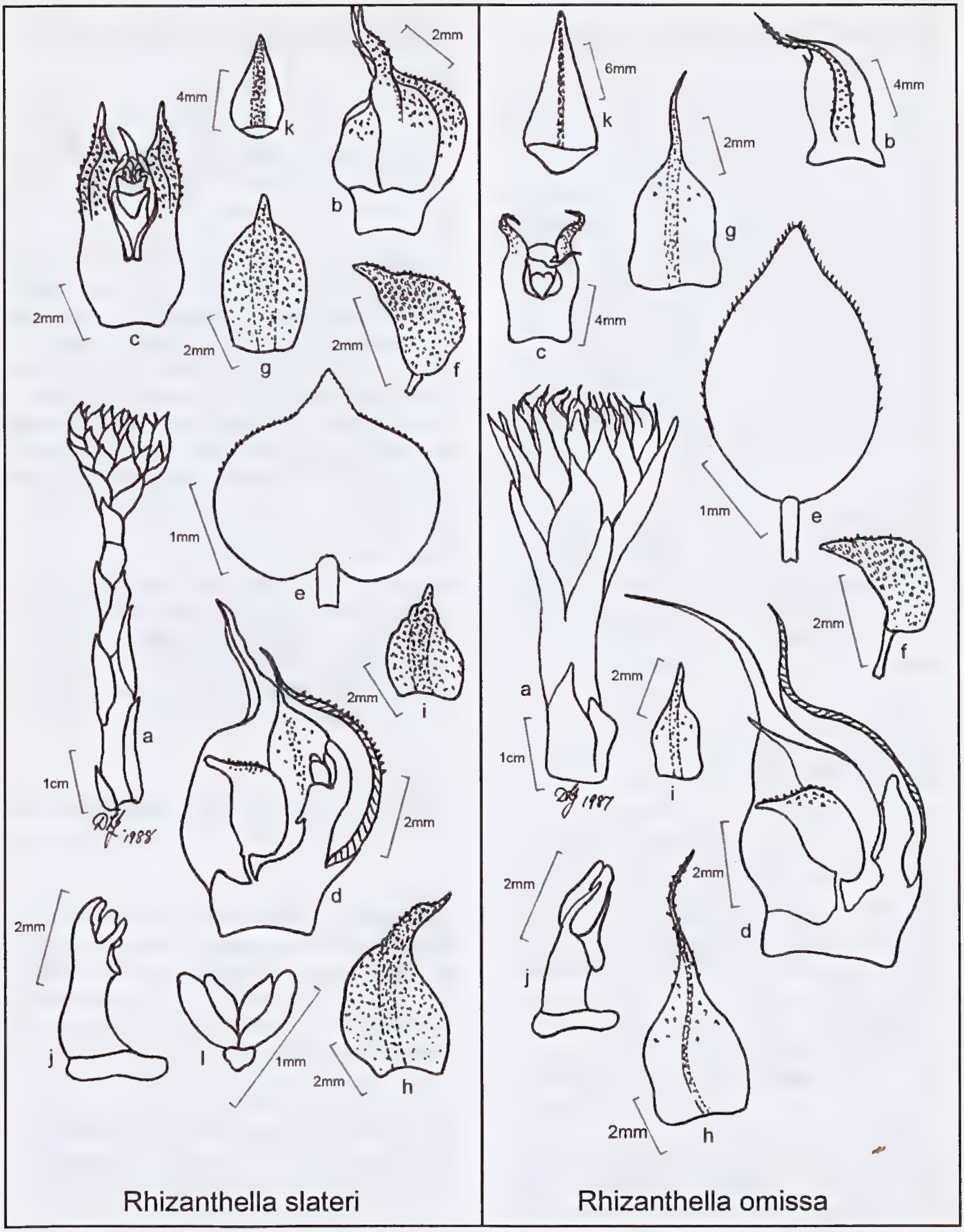
92 Pages
Eye-catching Colour

Subscription Rates
within Australia $45.00 p.a.
e-mail: hoges@keypoint.com.au

Check out our home page on the internet
www.orchidsaustralia.com

Orchids Australia
P.O. Box 4540,
Bathurst Street, Hobart, Tas, 7000

Mastercard and Visa
(Advise Card, Name,
Number and Expiry date)


Rhizanthella slateri

Rhizanthella omissa

Caption: Comparison of *Rhizanthella slateri* and *R. omissa*. LHS, *Rhizanthella slateri*, Wisemans Ferry, New South Wales. a. peduncle and flowerhead; b. flower from side; c. flower from front; d. longitudinal section of flower; e. labellum, flattened; f. labellum from side; g. dorsal sepal, flattened; h. lateral sepal; i. petal; j. column from side; k. fertile bract, l. pollinarium.

RHS, *Rhizanthella omissa,* Lamington National Park, G.Kouskos (drawn from type at BRI). a. flowerhead and part of peduncle; b. flower from side; c. flower from front; d. longitudinal section of flower; e. labellum, flattened; f. labellum from side; g. dorsal sepal, flattened; h. lateral sepal; I petal; j. column from side; k. fertile bract.

Conservation Report. (From Aug 2005)

Alan Stephenson, Conservaqtion Officer

Aug. 3
During visit to Victoria I was contacted by the office of Senator Ian Campbell, Federal Environment Minister following letters I had written regarding various conservation matters. After getting more detailed information from my home that evening I was told to expect a phone call the next day. No call was received.
Upon my return to New South Wales I sent an e-mail to Senator Campbell regarding the above with no response. The following day I rang his office and was asked to resubmit the original letter. This was done immediately.

Sept. 1
Received a letter regarding Biodiversity Banking proposal from the Department of Environment and Conservation (DEC). This is a proposal to offset the loss of land comprising areas of good biodiversity, which are lost in the course of development.

Sept. 8
Reply to above, rejecting the proposal as a soft option, feel-good cop-out.

Sept. 9
Ring ANOS Ballina regarding Stateline program for road through wetland to Gold Coast Airport – No response.
Ring Len James of Kabi Group and Dave Groffen re above; with no information forthcoming.
E-mail to Qld Environment Protection Agency; no information of any use supplied.
E-mail Stateline program with no response.

Sept. 12
Submission to Senator Campbell, Premier Morris Iemma, Planning Minister Frank Sartor, Environment Minister Bob Debus and finance minister Michael Costa regarding sp. 15 at Kurnell and its relevance to proposed Desalination Plant.

Sept. 20
Submission to Senator Campbell, Premier Iemma, Frank Sartor and Bob Debus regarding *Prasophyllum affine* at Vincentia and *Rhizanthella slateri* at Bulahdelah.

Sept. 22
Reply from DEC thanking me for my input and an assurance of further opportunities to participate in Biodiversity Banking initiative.

Sept. 26
E-mail from Darryl Thorpe of Taralga (N.S.W.) via Graeme Bradburn and ANOS Website regarding *Diuris aequalis* and threat from proposed firewood collection business. Reply immediately to Mr. Thorpe and following further e-mail contact and phone conversation with Mr. Thorpe, I forwarded a submission to Mr. John Bell, General Manager of the Upper Lachlan Shire Council (ULSC).

Sept. 27
Meeting in Nowra with Senator Ursula Stephens and Matt Brown MP (NSW). Spoke on several conservation matters regarding Main Rd 92, Vincentia and *R. slateri* at Bulahdelah. I then requested a meeting with either Frank Sartor and/or Bob Debus.

Sept. 29
Sent an e-mail to Clr. Brian Moloney of ULSC re *D. aequalis* with no reply.

Oct. 4
Received a letter from Department of Environment and Heritage requesting my comments on nomination of *R. slateri* for listing under the Commonwealth Environment Protection Biodiversity Conservation Act 1999.

Oct. 5
Visit Taralga to meet with Darryl Thorpe and Mark Selmes. These two have galvanized local opposition to the firewood collection business which is destroying the habitat of *D. aequalis*. Plants of *D. aequalis* were accidentally found by these two local land owners and both wrote submissions to ULSC against the felling of trees for the firewood business. It appears ULSC had not informed local property owners of the existence of this threatened species, when applications

calling for objections to the felling of trees for the business were requested. The business proponent was felling trees on his and several other properties prior to the application for the business. Under the then Native Vegetation Act, 2ha was able to be cleared each year for the purpose of construction of a farm building, dam, fence or residence. The proponent was clearing 2ha on some adjacent lots without charge to avail himself of the firewood in addition to trees on his own property.

Both Mr. Thorpe and Mr. Selmes contacted DEC and they subsequently contacted the ULSC and local land owners, most of which then denied permission to have their land cleared. During my first visit I was shown the damage caused by the clearing and the possible threat from bush firs through large windrows of fallen trees and stacks of wood. I also pointed out numerous orchid species during the course of the day.

On my return to Nowra I immediately wrote a second submission to the ULSC Environment Dept. stating my views on the probable environmental damage which would be caused by the clearing. No response received.

Oct. 11
Replied to DEH regarding *R. slateri* listing under EPBC act.

Oct. 24
Met with local federal member, Joanna Gash to request a meeting with Senator Campbell. Supplied her with copies of the letters I had written to him.

Nov. 5 Attended field day at Taralga property of Mark Selmes organized by officers of DEC, Keith MacDougall, Damon Oliver and Lorraine Oliver. Noted three individuals of *D. aequalis* on the property (200acres), plus several other orchid species.

Oct. 9
A meeting with Senator Campbell, Joanna Gash, Alan Stephenson and a legal representative in Mr. Campbell's office was arranged for 6.30pm on this day. The meeting lasted 30 minutes during which I listed the problems associated with *P. affine*, other orchid species at Vincentia and *R. slateri* at Bulahdelah. Sen. Campbell promised to contact Bob Debus regarding these matters and also the local federal member for the Paterson electorate, Mr. Bob Baldwin. The meeting was largely unsatisfactory as the Senator seemed uninterested in listening to any detail I had prepared for this meeting. However, I was pleased to have the meeting and at least make the contact. The legal representative (Peta) assured me I would be contacted in due course regarding the matters I presented.

Oct. 22
Attended a public meeting with Amanda Fazio MLC and again spoke on environmental matters. I mentioned the NSW Parliament was soon to meet in Kiama and requested she try to get a meeting for me with either Frank Sartor and/or Bob Debus. Unfortunately despite her attempts my request was not successful.

Nov. 17
E-mail to Dr Kingsley Dixon re *R. slateri*. He gave me e-mail address of Phillip Cribb and suggested I inform him of *R. slateri*. Did this but have not received a reply. Also posted a lengthy notice on Kew Botanic Gardens Conservation Index (BGCI) with no result.

Dec. 21
I was contacted by e-mail and telephone by Mr. David Mutton, a Team Leader with the Urban Assessments section of the Department of Infrastructure, Planning and Natural Resources (DIPNR). He informed me he had been instructed to arrange a meeting with me regarding the submission I had written about the Stockland development at Vincentia. This meeting will take place in Sydney at a time and date to be arranged. Mr. Mutton has recently lost the Ecologist from his office and is now awaiting a replacement to enable the meeting to be scheduled.

Jan. 7 2006
Drove to Callala Bay at the request of some local residents, to view the 50 acre site for a Caravan Park to house 2000 people.

Jan. 20

Following a phone call from David Mutton a meeting was arranged for 20-1-2005. This meeting lasted one hour and an Ecologist, Liz Boggie was present. She will be my point of contact.

During the meeting I outlined my concerns regarding the Vincentia site of *P. affine* as per the notations on a list of points I made for mention and I feel I made some impact with my list of concerns. DIPNR also have some concerns about this project but I gained the impression that despite these concerns, construction will occur on this site and the sticking point is how much damage will occur to *P. affine*, its habitat and that of the pollinator. Aside from *P. affine* there is the consideration of *Cryptostylis hunteriana* and also *Calochilus sp.* aff. *grandiflorus* (undescribed species), along with numerous bird and animal species. Many social concerns are yet to be addressed, such as traffic volume, the installation of two sets of traffic lights, availability of health care professionals and the expected decrease in jobs through businesses closing with the construction of a large regional retail centre. Pollution of the Jervis Bay Marine Park from water run-off is also a concern. Also spoke of the concentration of developments in the vicinity of the roundabout with the probability of 3000 people resident there in a few years.

Mr. Mutton is expected to visit the site at some time and I have asked for the right to accompany him during this visit. This seems most likely. A Master Plan has been lodged for the site but so far this is a concept only and will not be finalised until development approval is given. This plan will then be put on public exhibition. This is not likely until late February or early March, 2006.

Consideration was given by David Mutton to making *P. affine* a feature of the development and arrangements made to show it to people and have them recognise its importance and fragility. This idea was quickly diffused as I mentioned the likelihood of some who would desire to have a plant at home or at least pick some flowers. As this species relies entirely on insect pollination, the idea of access to the species by unsupervised people must be actively discouraged. Ken Murray (Shoalhaven City Council) and Stockland reps originally mentioned this during Recovery Team talks. They mentioned a raised boardwalk between the retail section and the Leisure Centre. I asked if the boardwalk would have sides which would not allow access to the orchid area and both said most likely not. I then said I would be furious if access to the orchid habitat was permitted and the idea died at that point.

I also mentioned habitat corridors for wildlife, floodlighting of the sporting oval, the commercial centre and residential sections and the probable adverse effect on pollinators from this. I also spoke of the 30 metre buffer zone dispute with DEC between one colony of *P. affine* and a section of Town Houses. Stockland want to limit this to 25 metres and my desire to completely eliminate this section. This is the land adjacent to the pumping station and near the oval. There is a colony of *P. affine* behind the oval and another to the left (west) of the pumping station.

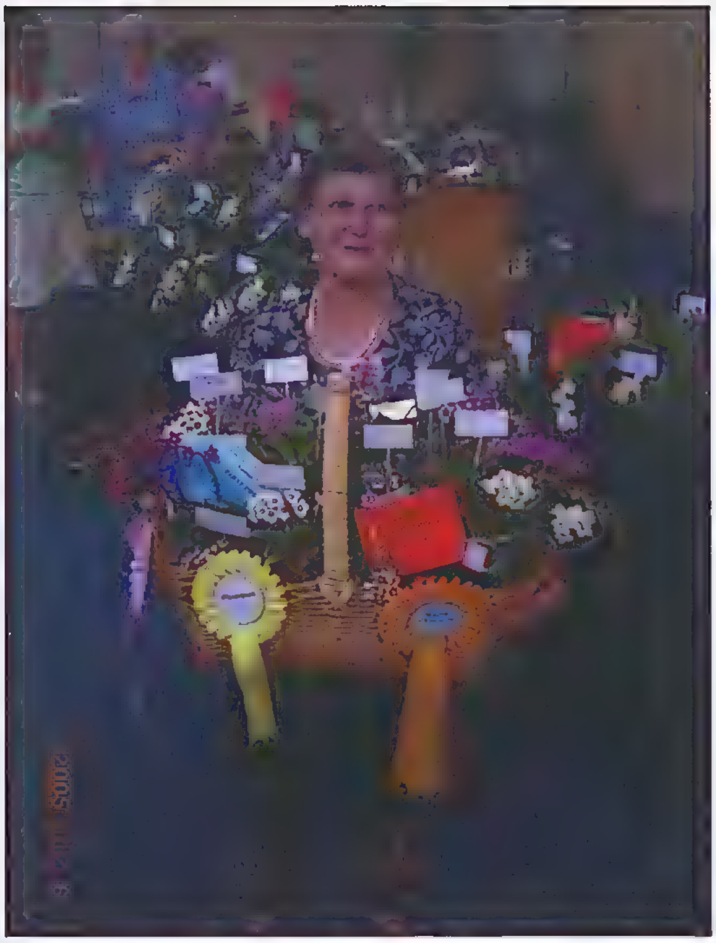
At this stage DIPNR is now known as the Department of Planning and the entire project has been called in, as it has been zoned 3A. This gives the project state significance and requires no public input or comment. I will question this with relevant people.

Jan 24th

Forwarded letter to Upper Lachlan Shire Council re *Diuris aequalis* and consent conditions imposed on firewood collection business. No reply.

On 14th February 2006 I received an e-mail photo of an orchid, which I identified as *Gen. baueri.* The photo was sent by a consultant undertaking an environmental survey of a large area of land at Callala Beach to be used for housing development. I arranged a visit to see this orchid and learned his team had located approximately 70 individuals. He has requested a 50 metre buffer zone around each plant and this along with other threatened flora and fauna will cause the developer to seriously reconsider his plans. More on this as it unfolds. This site is 500 metres from the above proposed caravan park site I visited on Jan 7th.

-oOo-



Native Orchid Show at Geelong.

On the first weekend in November 2005, the Geelong Group held their orchid show. It is our only show for the year and is held to display our member's plants. It consisted of mainly *Sarcochilus* as it is a good time for them down here, only one *Dendrobium* (can you believe it) and to appease everyone, we also had displays of orchids other than Aussie Natives, plus a display of succulents and another of bromeliads. It turned out to be a very pretty show and we had many favourable comments. In total we had 316 orchid entries which is up by about 20% from our previous show record, so it was very satisfying for the hard working committee and members of the club.

One of our lady members Luba Mishura scooped the pool with the prizes. She won Grand Champion Orchid of the Show with a *Sarcochilus* Star Struck 'Red Comet' x self, Champion *Sarcochilus* with the same plant and Pre-eminent entry which was given to her basket of very well grown and flowered *Sarcochilus*. Luba works hard over the weekend of the show in the sales area, she is also on the committee, and so it is nice for someone to have a win when they put so much energy into running the club.

The only *Dendrobium* entered in the show was a *Dendrobium* Ella V Leaney and was entered by our oldest couple - Margaret & Hugh Wettenhall (both in their 90's). Although they sold up their house and got rid of most of their orchids a few years ago, they just can't give them up all-together, so they still have a few on the back porch to keep Hugh busy. Margaret does not do much with the orchids these days as her eyesight is very poor.

Reserve Champion Orchid of the Show went to a little seedling flowering for the first time, bred by David Butler and it was *Sarcochlus*. Yvette x *S. weinthalii* - owned by Jim Buchanan. This was a very pretty little flower covered in spots and stood out amongst his other plants.

One of our newer members, Yvonne Bukofsan, offered her help over the weekend. The member who usually does the door entries had recently broken an arm and couldn't attend; we offered Yvonne this job which she diligently did over the whole weekend. It is great when new members jump in and help out with these sometimes mundane jobs. It all worked out well and to top it off, Yvonne won the raffle which was an orchid and a beautiful Christmas wall hanging made by Brenda Buchanan. A big thank you to everyone who assisted over the weekend of the show. Photos and text Frances Wilde

Ira Butler Trophies for 2005.

The **Gold Ira Butler Trophy 2005**, for the Champion Australian Native Orchid Hybrid of the Year has been presented to *Dendrobium* Anne's Rainbow Surprise 'Diana', owned by Lloyd Perryman of Victoria. (Hybridist: Issy Klein)

The following ten 'runners up' receive **Silver Ira Butler Trophies**

Dendrobium Cassidy 'Maya', owned by Phil Grech. (Hybridist: Kevin Moore)
Dendrobium Jayden 'Goodie' AM/OSCOV, owned by Phil Grech. (Hybridist: John Purvis)
Dendrobium Avril's Gold, owned by Reg and Gill Shooter.
Dendrobium X *gracillimum*, owned by John and Bev Gay.
Dendrobium Dianne Gee, owned by F. and H. Vernon. (Hybridist: DUNO)
Dendrobium Australian Sunset, owned by Michael Drobski. (Hybridist: Australian Orchid Nursery)
Sarcochilus Melody 'Bubbles', owned by DUNO. (Hybridist: DUNO)
Dockrillia teretifolia x *D. pugioniformis*, owned by Mark Brown.
Dendrobium Avril's Gold 'Wingham' AM/AOC HCC/ANOS 2003, owned by Don Cruickshanks. (Hybridist: Ray Hill)
Sarcochilus Weinhart, owned by Mike Fish.

The following will receive **Ira Butler Certificates**

Dendrobium Lustrous 'Dungog', owned by Dennis and Barbara Stahlhut. (Hybridist: Ken Russell)
Dendrobium Hilda Poxon, owned by Steve Howard. (Hybridist: Australian Orchid Nursery)
Dendrobium (Victorian Flare x Jesmond Sparkler), owned by Ron Keane. (Hybridist: Australian Orchid Nursery)
Dendrobium Lynette Banks, owned by Greg and Helen McCourt.
Dendrobium Jamestown 'Sue Gee', owned by Graham and Sue Zerbe. (Hybridist: Adelaide Orchids)
Dendrobium Dreamtime, owned by John Frocklington.
Dendrobium Candice '#1A', owned by F. and H. Vernon.
Dendrobium Riversun '#1', owned by F. and H. Vernon. (Hybridist: Neville Roper)
Dendrobium Cheeky Sheen, owned by Michael Drobski. (Hybridist: DUNO)
Dendrobium Rutherford Blushing Bride x *D. speciosum var. speciosum* 'Bevan', owned by Bevan Burnham. (Hybridist: Bevan Burnham)
Dendrobium (Burgundy Cream 'Best' x Jesmond Gem 'Warringah Champ') 'Mount Ford', owned by Laurie Mountford.
Dendrobium X *gracillimum* 'Billorc', owned by Bill and Odette Clavant.
Dendrobium Amber Banks, owned by Henk van den Berg. (Hybridist: John Purvis)

The **Bill Murdoch Trophy 2005**, for the Champion Australian Species of the Year has been presented to *Dendrobium speciosum* var. *speciosum* 'Heather', owned by Ron and Heather Campbell. (hybridist: S Penman)

The following will receive **Bill Murdoch Certificates**

Sarcochilus falcatus ('Clarrie' x 'Andrew' #3), owned by F. and H. Vernon. (hybridist: John Woolf)
Sarcochilus hartmannii forma Blue Knob 'Twojayss', owned by John and Joan Sheath.

Dockrillia linguiformis, owned by Keith Scott.
Dockrillia teretifolia, owned by F. and H. Vernon.
Pterostylis baptistii 'Gosford', owned by Malcolm Guy.
Diplodium robustum (Pterostylis robusta), owned by Nesbitt Orchids.
Dendrobium falcorostrum 'Melissa', owned by Peter and Lois Williams.
Dendrobium lithocola, owned by Steve Howard.
Dendrobium kingianum 'Cosmos', owned by Norm and Kay Mitchell. (Hybridist: Norm and Kay Mitchell)
Dendrobium speciosum ('Little John' x 'Mackay'), owned by Norm and Kay Mitchell. (Hybridist: Ted Walmsley)
Dendrobium speciosum var. *speciosum* 'Windermere' x *Dendrobium speciosum* var. *curvicaule* 'Daylight Moon', owned by Fred Fear. (Hybridist: Ted Walmsley)
Dendrobium speciosum var. *speciosum* 'Beechwood', owned by Michael Drobski. (Hybridist: Rod Graham)
Microtis media 'Graham', owned by Michael Zink.
Sarcochilus fitzgeraldii 'Magnificent', owned by DUNO. (Hybridist: DUNO)
Dendrobium falcorostrum 'Fran', owned by David Butler.
Dendrobium speciosum var. *speciosum* 'Windermere' x *Dendrobium speciosum* var. *curvicaule* 'Daylight Moon', owned by Michael Drobski. (Hybridist: Neil Finch DUNO)
Dendrobium speciosum var. *grandiflorum* ('Camp Creek' x 'Taipan'), owned by Mrs P A Murn. (Hybridist: Macquarie Native Orchids)
Dendrobium speciosum var. *speciosum* 'National White' x *Dendrobium speciosum* var. *curvicaule* 'Neil's Pick', owned by Lorraine and Bill Dobson. (Hybridist: Neil Finch DUNO)
Dendrobium speciosum var. *speciosum* 'Windermere' x *Dendrobium speciosum* var. *curvicaule* 'TB No1', owned by Ted Walmsley. (Hybridist: Tony Blewitt)
Dendrobium speciosum var. *grandiflorum* 'Will's Gold', owned by Yvonne Ferris.
Dendrobium tetragonum, owned by Syd Burton. (Hybridist: John Purvis)
Dendrobium speciosum var. *curvicaule* 'Southern Cross', owned by DUNO
Sarcochilus fitzgeraldii 'Magnificent Truly', owned by DUNO. (Hybridist: DUNO)

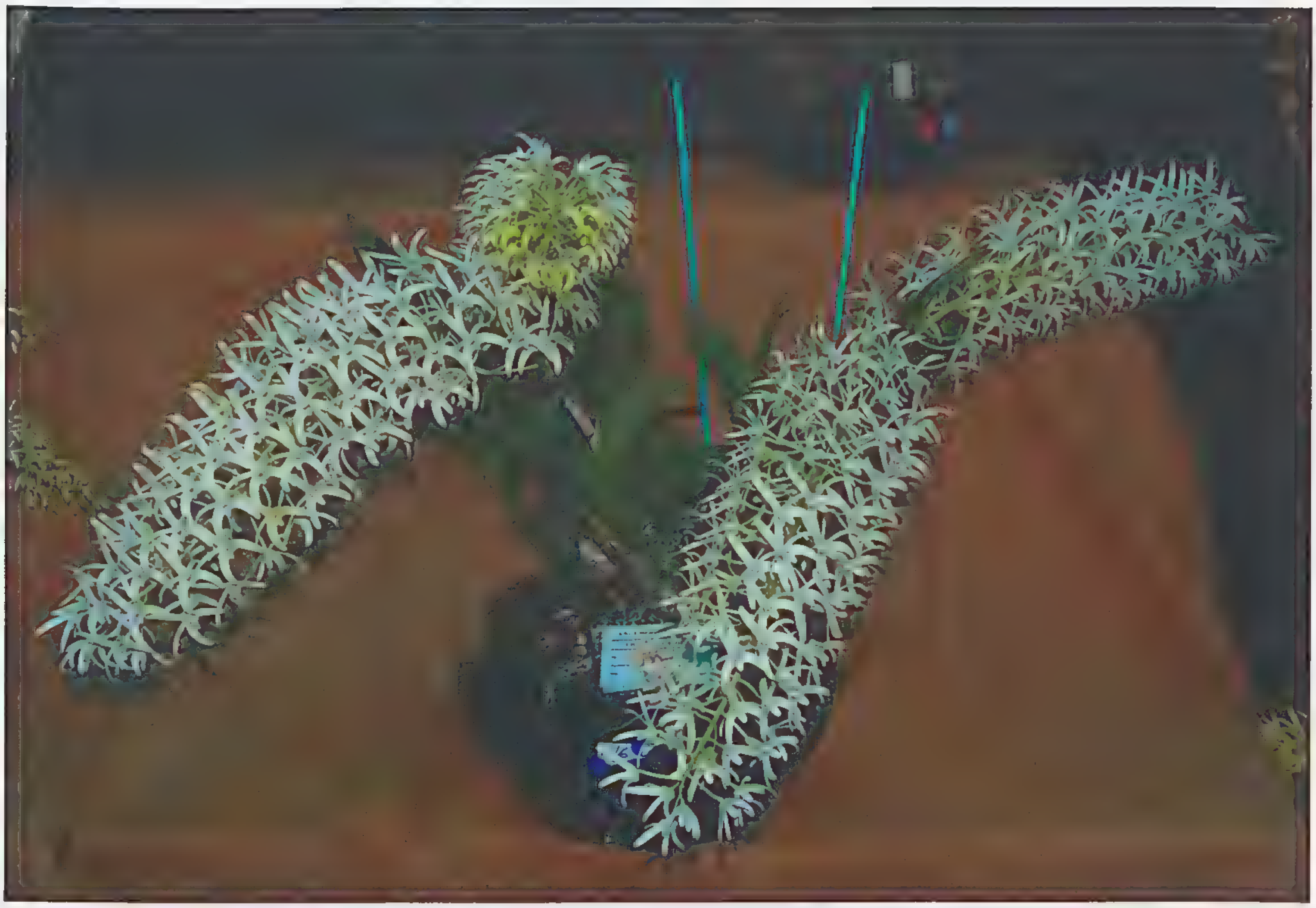
The **G Herman Slade Trophy 2005** for Australasian Native Orchid Hybrid of the Year has been presented to *Dendrobium* (Angela x *tangerinum*) x *D. canaliculatum,* owned by DUNO. (Hybridist: Brian Coleman)

The following 'runners up' were noted

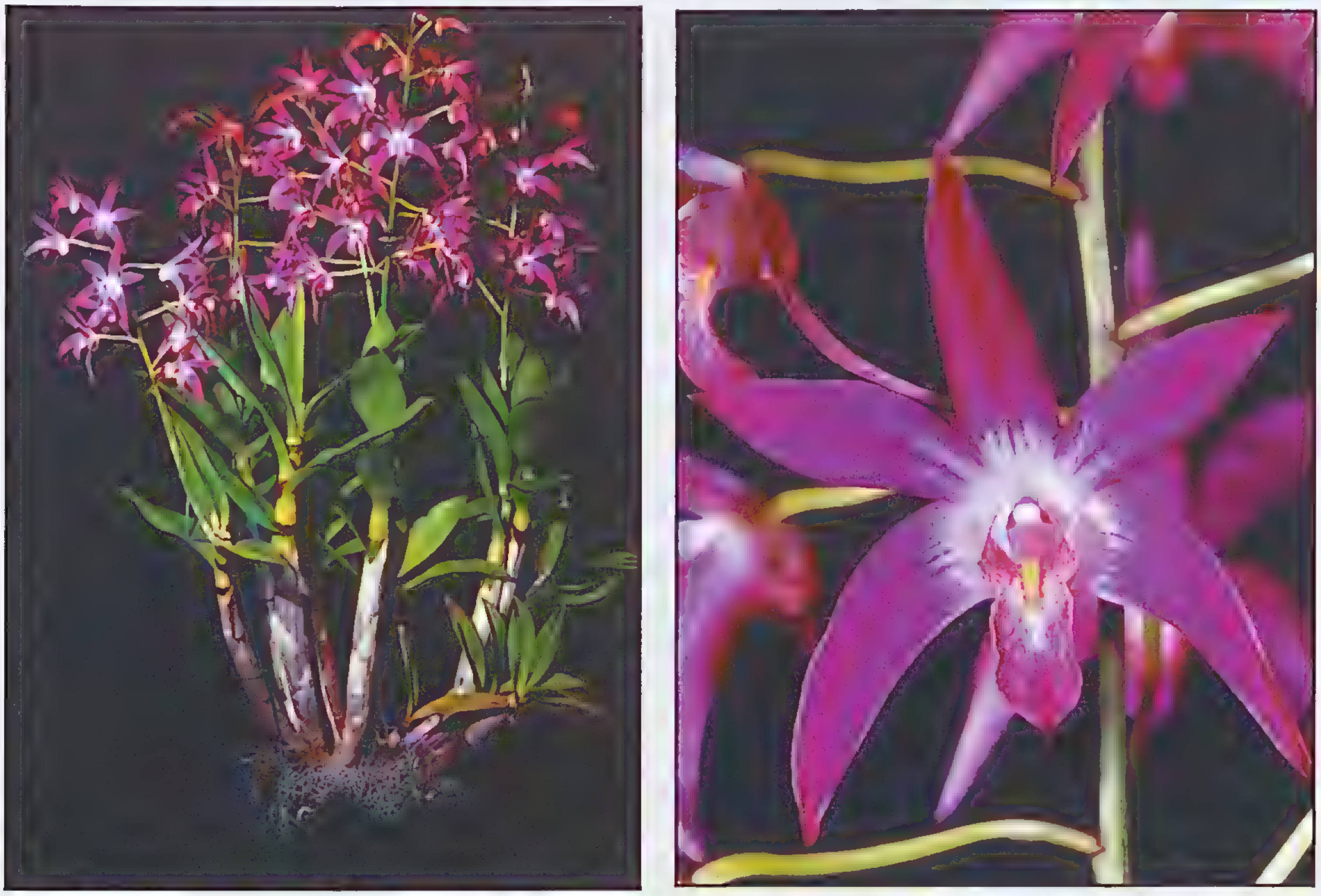
Dockrillia striolata x (*convoluta x fuliginosa*), owned by Henk van den Berg. (Hybridist: Bill Skillicorn)
Dockrillia Tweetie, owned by DUNO. (hybridist: DUNO)

The **G Herman Slade Trophy 2005** for Australasian Native Orchid Species of the Year has been presented to *Dendrobium polysema*, owned by Phil Spence. (hybridist: Phil Spence)

Wiliam Olsen
Hon. Secretary, I.B.T.C.
4 Regal Ave
Kings Langley, NSW 2147



Dendrobium speciosum var. *speciosum* 'Heather', owned by Ron and Heather Campbell. (Hybridist: S Penman)



Dendrobium Anne's Rainbow Surprise 'Diana', owned by Lloyd Perryman of Victoria.(Hybridist: Issy Klein)

Dendrobium (Angela x *tangerinum*) x *D. canaliculatum,* owned by DUNO. (Hybridist: Brian Coleman)

Dendrobium polysema, owned by Phil Spence. (Hybridist: Phil Spence)

DIRECTORY OF A.N.O.S. GROUPS (& Associated Societies)

NEW SOUTH WALES

- **ANOS Central Coast**, P.O. Box 3010, Erina 2250. ☎(02) 4343-1809. Meetings 8pm, 2nd Wed. each month. Temple Kiely Visitors Centre, Department of Agriculture Station, Research Rd., Narara.
- **ANOS Far North Coast**, P.O. Box 949, Ballina 2478. ☎(02) 6686-6303. Meetings 7.30pm, 3rd Fri. each month. C.W.A. Room, River Street, Ballina.
- **ANOS Illawarra**, 2 Wiford St, Corrimal, 2518. ☎(02) 4284-8308. Meetings 7pm, 2nd Tue. each month. Legacy House, 96 Market St., Wollongong.
- **ANOS Macarthur & District**, 43 Strickland Cres, Ashcroft, 2168. ☎(02) 4626-1825. Meetings 8pm, 3rd Thur. each month. Narellan Community Hall, Queen St., Narellan.
- **ANOS Mid-North Coast**, P.O. Box 128, Taree 2430. ☎(02) 6585-9328. Meetings 7.30pm, last Fri. each month. (Held at Taree or Wauchope - telephone Secretary for details).
- **ANOS Newcastle**, P.O. Box 273, Kotara Fair 2289. ☎(02) 4975-3729. Meetings 7.30pm, 4th Thur. each month. John Young Community Hall, Thomas St, Cardiff.
- **ANOS Port Hacking**, P.O. Box 359, Gymea 2227. ☎(02) 9524-9996. Meetings 8pm, 4th Wed. each month except December and January. (telephone Secretary for details regarding the venue).
- **ANOS Sydney**, 22 Rabaul Ave, Whalan. ☎(02) 9624-1768. Meetings 8pm, 3rd Fri. each month. Senior Citizens Hall, Baulkham Hills Community Centre (off Conie Ave.) Baulkham Hills.
- **ANOS Warringah**, P.O. Box 421, Forestville 2087. ☎(02) 9416-4306. Meetings 8pm, 3rd Tue. each month. Community Hall, Starkey St., Forestville.

QUEENSLAND

- **ANOS Kabi**, PO Box 424, Aspley 4034. ☎ (07) 3359-5752 Meetings 7.30pm, 2nd Tue. each month (except Jan.). Bald Hills Memorial Hall, 2126 Gympie Rd., Bald Hills.
- **ANOS Mackay & Dist.**, PO Box 138, Koumala, 4738. ☎(07) 4950-1065. Meetings 7.30pm, 2nd Thursday of each month at the Andergrove Community Centre, Celeber Drive, Andergrove.
- **ANOS Townsville**, 92 Curie St, Wulguru, 4811. ☎(07) 4778-4311. Meetings 8pm, 1st Tue. each month. Townsville Orchid Society Hall, Pioneer Park (opp. Willows Shopping Centre), Thuringowa..
- **Native Orchid Society of Toowoomba**, P.O. Box 2141,Toowoomba 4350. Meetings 7.30pm, 1st Fri. each month. Luthern Church Hall, Cnr. West and Alderly Sts, Toowoomba.

VICTORIA

- **ANOS Geelong**, Unit2, 2 Elizabeth St., Belmont 3216. ☎(03) 5243-4286. Meetings 8pm, 2nd Wed. each month. Uniting Church Hall, Moorabool St., South Geelong.
- **ANOS Victoria**, P.O. Box 354, Glen Waverley 3150. ☎(03) 9874-5343. Meetings 8pm, 1st Fri. each month. Demonstration Hall, Burnley Horticultural College, Swan St., Burnley.
- **ANOS Melbourne Suburbs Group**, PO Box 239 Mt Evelyn Vic. 3796. ☎(03) 59622758. Meetings held on the 4th Wednesday of the month at 7.30pm at Montrose Primary School, Leith Rd., Montrose 3765 (Melways 52 D7)

SOUTH AUSTRALIA

- **Native Orchid Society of South Australia**, P.O. Box 565, Unley 5061. ☎(08) 8356-7356. Meetings 8pm, 4th Tue. each month. St. Matthews Hall, 67 Bridge St., Kensington.

WESTERN AUSTRALIA

- **ANOS Western Australia**, 95A Ewen St., Scarborough 6019. ☎(08) 9341-6709. Meetings 8pm, 2nd Mon. each month. Wilson Community Hall, Braibrise Rd., Wilson.

NEW ZEALAND

- **ANOS New Zealand**, Margaret Phair, 21 Paparoa Rd, Howick, Auckland, New Zealand.
- **New Zealand Native Orchid Group**, 22 Orchard St., Wadestown, Wellington, New Zealand.

The Australasian Native Orchid Society Inc., Offers YOU…

BADGES

A.N.O.S. Membership Badge

(*Thelymitra ixioides*)	$5.00 ea.

Conservation badges:-

1997 *Sarcochilus falcatus*	$5.00 ea.
1996 *Pterostylis cucullata*	$5.00 ea.
1995 *Prasophyllum petilum*	$5.00 ea.
1994 *Dendrobium affine*	$5.00 ea.
1993 *Thelymitra ixioides*	$5.00 ea.
1991 *Thelymitra epipactoides*	$5.00 ea.
1990 *Dendrobium bigibbum*	$5.00 ea.

A.N.O.S. Conference Badges:-

1st *Pterostylis gibbosa*	$3.00 ea.
4th *Caleana major*	$5.00 ea.
5th *Oligochaetochilus saxicola*	$5.00 ea.

Plus postage and handling

1 to 6 badges (Australia)	$2.50
1 to 6 badges (Overseas)	$5.00

••••

The following prices include postage and handling....

A.N.O.S Medallions

Bronze and Silver: provision for engraving on the reverse side .... $15.00 ea

••••

BOOKS

Proceedings of the 1st Australasian Native Orchid Conference

(Australia)	$17.00
(Overseas)	$20.00

Proceedings of the 5th Australasian Native Orchid Conference

(Australia)	$25.00
(Overseas)	$30.00

Cultivation of Australian Native Orchids – 2nd Edition: A.N.O.S. Victorian Group

(Australian)	$21.00
(Overseas)	$24.00

The Orchadian – Back Issues

Most numbers of Vol. 12:	$6.00 per issue.
All numbers of Vol. 13:	$6.00 per issue.
All numbers of Vol. 14:	$8.00 per issue.

••••

DRAWINGS

Superb colour prints of J.J. Riley's drawings on Australian Native Orchids are now available;

Set 1 - *Pterostylis maxima, Dipodium variegatum, Pterostylis daintreana, Pterostylis grandiflora, Cryptostylis erecta, Genoplesium filiforme, Diuris lanceolata, Rimacola elliptica* **$15.00**

Set 2 – *Pterostylis sanguinea, Pterostylis depauperata, Acianthus caudatus, Caladenia concinna, Chiloglottis truncata, Dendrobium kingianum, Sarcochilus australis, Dendrobium striolatum* .. **$15.00**

Set 3 – *Dendrobium moorei, Lyperanthus nigricans, Dendrobium bowmanii, Eriochilus cucullatus, Pterostylis vittata, Sarcochilus ceciliae, Sarcochilus falcatus, Cymbidium canaliculatum* **$15.00**

••••

Bankcard, Mastercard, Visa and American Express welcome: quote card number, cardholder's name, Amex ID number (if applicable) and expiry date with your signed order.
Send order to ...

Treasurer, ANOS
P.O.Box 318
Willoughby NSW 2086

(Make cheques payable to ANOS Inc.)

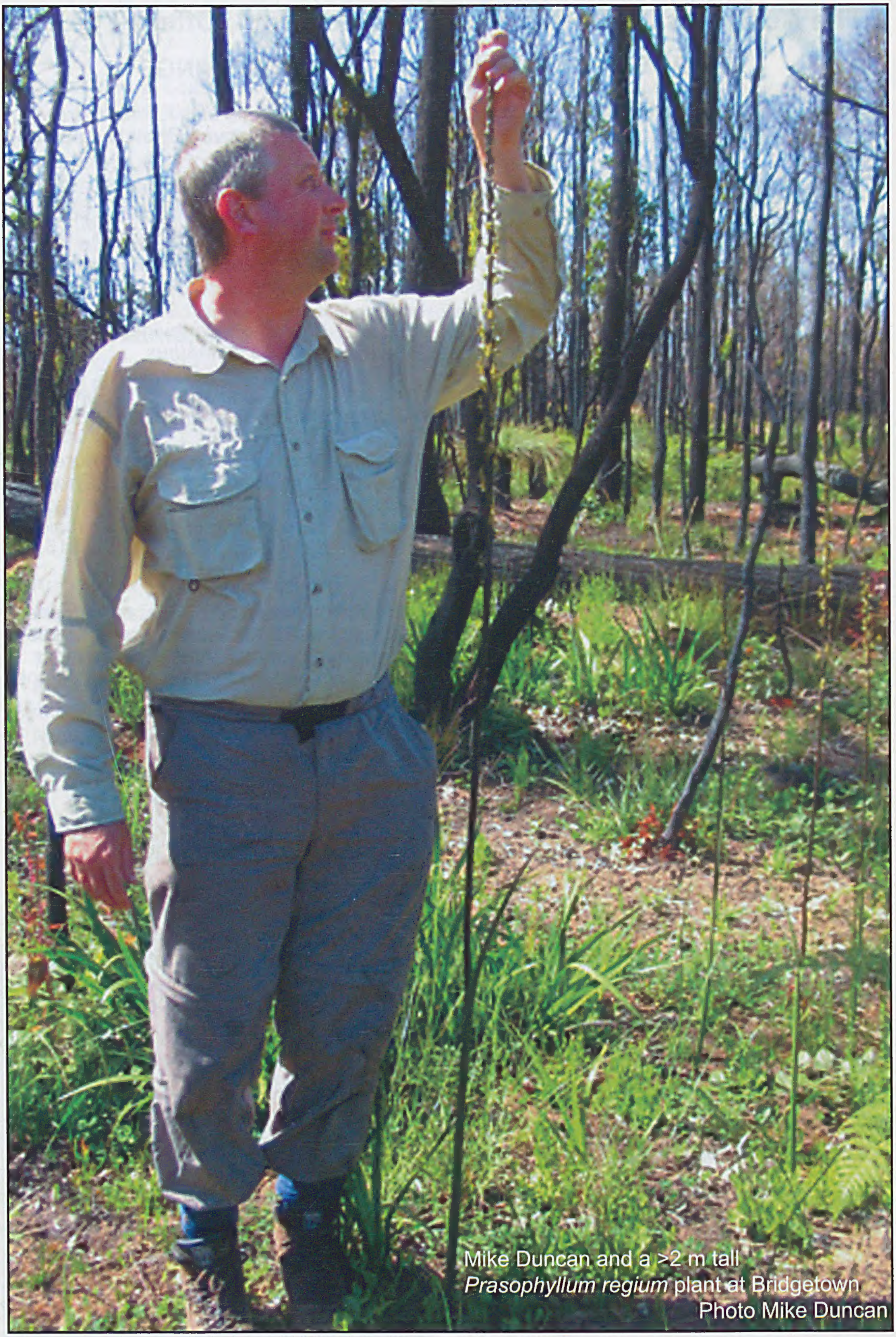
ANOS WEBSITE:

http://www.anos.org.au

Advertising Costs
Per Four Issues, June - March.

1/6 page $120.00
1/4 page $160.00
1/2 page $300.00
Space is available, please contact the Treasurer for further information

PO Box 318, Willoughby 2068
or through the web site
www.anos.org.au



Mike Duncan and a >2 m tall *Prasophyllum regium* plant at Bridgetown
Photo Mike Duncan